JANUARY 7, 1952

NEWS ISSUE

Electrical World

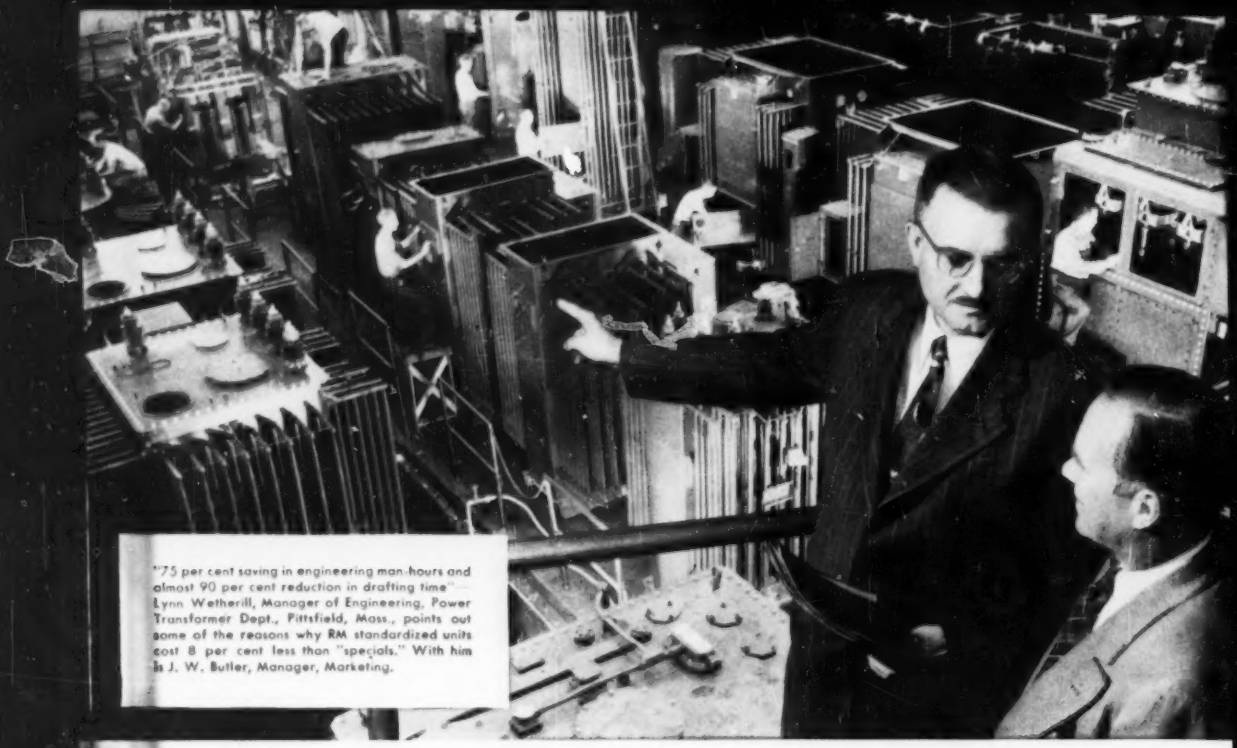
Price 35 Cents

A McGRAW-HILL PUBLICATION

Dan E. Karn, new Consumers Power Co president

Use More Aluminum, Less Copper Page 7

Money Market Tight Page 50



"75 per cent saving in engineering man-hours and almost 90 per cent reduction in drafting time"—Lynn Wetherill, Manager of Engineering, Power Transformer Dept., Pittsfield, Mass., points out some of the reasons why RM standardized units cost 8 per cent less than "specials." With him is J. W. Butler, Manager, Marketing.

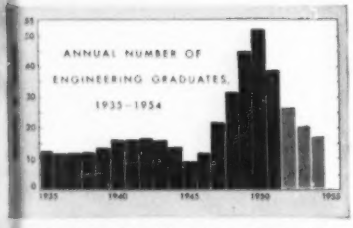
How standardization helps relieve today's shortage of engineers

One of the most critical problems facing the electrical industry today is the dwindling supply of trained engineers. With latest estimates showing fewer and fewer engineering graduates available, the situation will grow steadily worse over the coming years.

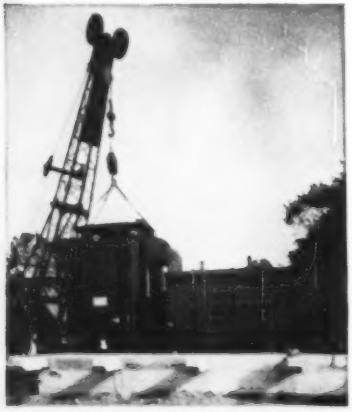
What can be done about it? One important measure is to conserve the engineering manpower that is already available. And an obvious step in this direction is in the wider use of pre-engineered, standardized equipment.

Many electric utilities are already finding that trained engineers are too valuable to be spared for detail-engineering and expediting. Increased adoption of standardized equipment will free them for the more important work of broad system planning. On the manufacturing level, expanded production of standardized equipment will be reflected in fewer man-hours required, lower costs and shorter deliveries. And it will permit engineers to spend more time on basic design improvements of value to the entire industry.

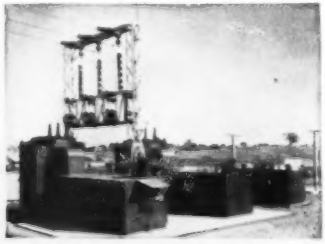
Today's rapid expansion, coupled with increasing manpower and material shortages, may make "specials" a luxury the industry can no longer afford. General Electric Company, Schenectady 5, N. Y.



U. S. Department of Labor chart shows number of engineering graduates will drop from 38,000 in 1951 to a low of 16,500 in 1954. Engineers needed by industry last year totalled about 80,000.



Trend to standardized equipment is illustrated by this G-E unit substation shown being installed on system of Western Massachusetts Electric Co. Supplied complete, ready to place on foundation.



"Everything standard, including the structure"—package substation is one of several that enabled small engineering force of San Diego Gas & Electric Co. to meet major load expansion.

MORE POWER TO AMERICA

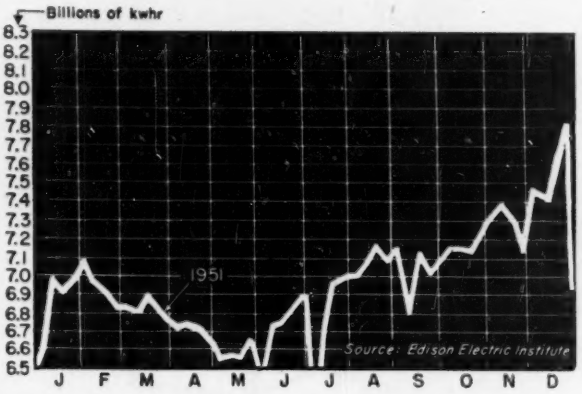
GENERAL ELECTRIC

301-179

VOLUME 137, NO. 1.

January 7, 1952

Electrical World



Output Week Ended Dec. 29—6,921,625,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific Coast
Dec. 29	+ 6.8	+1.0	+4.3	+3.5	+ 8.7	+ 7.6	+20.2	+11.8	+ 9.6
Dec. 22	+11.2	+8.1	+9.3	+8.6	+11.7	+14.3	+20.1	+13.3	+11.4
Dec. 15	+ 9.8	+6.1	+7.1	+6.5	+10.5	+11.3	+21.0	+13.9	+12.5

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load—Class I Utilities (Million Kw).	Oct.	63.33*	62.09	57.28
Capacity (Million Kw)	Oct.	74.68	74.29	67.51
Production (Billion Kwhr)	Oct.	32.44	30.28	29.16
Hydro		7.55	7.04	7.39
Fuel		24.89	23.24	21.77
Sales (Billion Kwhr)	Sept.	27.54	27.45	24.75
Residential		6.82	6.50	5.84
Commercial		4.89	4.91	4.29
Industrial		13.62	13.83	12.66
Other		2.22	2.21	1.97
Fuel Consumption				
Coal (Million Tons)	Oct.	9.58	8.60	8.52
Oil (Million Barrels)		5.44	5.07	6.14
Gas (Billion Cu Ft)		72.00	77.31	61.40
Net Income Class A & B Utilities ($ Million)	Sept.	57.48	53.92	56.88
December 52 Peak (Million Kw)*	Oct.	77.4	77.2	69.6
Kwhr per Residential Customer (12 Month Average)	Sept.	1,961	1,943	1,789
Revenue per Kwhr Residential Service (12 Month Average)	Sept.	2.83	2.83	2.90
Canadian Production (Million Kwhr)	Oct.	158.7	146.8	141.7

Business Statistics

FRB Industrial Production Index†††	Nov.	222.0*	224.0*	215.0
Gross National Product ($ Billion)	3rd Qtr	81.7	79.1	72.4
EW 5 Industry Production Index	Nov.	124.9*	124.2	118.1
ENR Construction Cost Index††	Dec.	114.8	114.7	110.8
BLS Consumer's Price Index	Nov.	188.6	187.4	176.4
NEMA Insulation Materials Sales Index†	Sept.	521	539	514
NEMA Electric Appliances Sales Index (Unadjusted)†	Sept.	264	209	430
NEMA Household Refrig. Sales Index†	Sept.	115	98	302

* Estimated † 1936 = 100 †† 1949 = 100 ††† 1937–39 = 100

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ELECTRICAL WORLD • Vol 137, No 1 • Jan 7, 1952
Member ABC and ABP

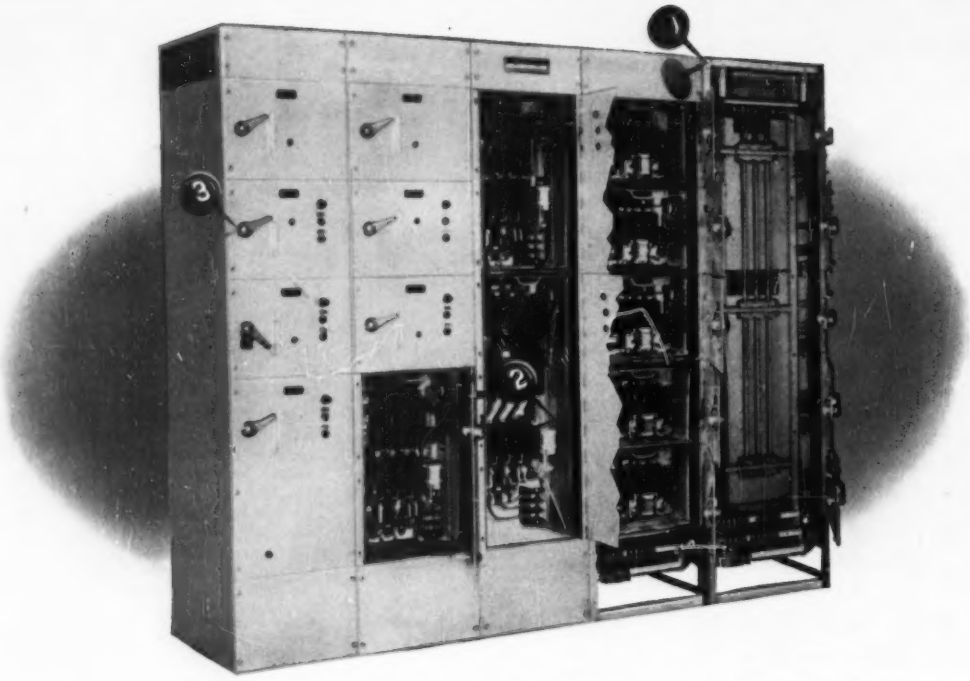
Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y.

Executive, Editorial and Advertising Office: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Electrical World — Subscription Service, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 18, N. Y. Allow ten days for change of address.

Please indicate position and company connection on all subscription orders.

Single copies 25c. For the United States and possessions $6 a year, $9 for two years. Canada, $7 for one year, $11 for two years, $14 for three years. (Canadian money, at par.) Pan-American countries, $15 for one year, $25 for two years, $30 for three years. All other countries $25 for one year, $40 for two years, $50 for three years. Entered as second class matter, November 16, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1952, by McGraw-Hill Publishing Company, Inc. Permission required to reproduce any of contents.



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And they really mean it when referring to Westinghouse Control Centers. Here you get top-quality construction which gives you all the advantages of centralized motor control . . . quality at every one of the following points:

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WESTINGHOUSE

CONTROL CENTERS

THE ELECTRICAL WEEK

Featured in This Issue—Defense mobilizers tell the industry to use more aluminum and less copper. Wire and cable manufacturers reveal their plans for making the substitution (p 7) . . . The power deficiency in West Germany is retarding its defense program (p 9) . . . FPC goes to the U. S. Supreme Court seeking to upset Appeals Court decision striking out conditions imposed on Idaho Power in an FPC license for its Bliss project (p 10) . . . Public Service Electric & Gas uses central testing laboratory and staff for its entire New Jersey system (p 16) . . . American Gas & Electric Co makes a motion picture for its subsidiaries to be used for community public relations (p 22) . . . Detroit Edison's automatic-programmed, load-frequency control system permits simultaneous control of 29 units in four plants (p 32) . . . Utilities seeking money will find the market tight (p 50).

• • •

Washington—NPA-DPA Chief Manly Fleischmann has hinted he will take another look at copper allotments for the electric industry to see what can be done . . . Thomas N. Peck of the Vanadium Corp of America is new deputy director of NPA's aluminum-magnesium division . . . Justice Department, legal advisor for federal agencies, still hasn't made up its mind on whether the Roanoke Rapids case should be appealed to the Supreme Court . . . Some half a dozen reports on the electric power situation—present and future—are being studied, and some may be released soon. Reports are from DPA, Depa, Morehouse Committee and Joint Congressional Committee on Defense Production . . . The 30-year license issued PG&E for its Kings River hydroelectric project is highly unusual in that all but five or six such licenses issued by FPC have been for 50 years . . . Electrical equipment "most likely" set off methane gas to cause the coal mine disaster which took 119 lives in Illinois the week before Christmas, government officials believe.

Detroit Edison's actual peak, reached on Dec. 19, was 1,702,000 kw as compared with a predicted peak of 1,750,000 kw. The smaller-than-anticipated peak was caused largely by industry shutdowns laid to conversion troubles, model change-overs, etc. . . . Los Angeles Department of Water & Power chalked up 1 million kw of generation for first time just before Christmas—not once, but twice.

Oklahoma City voters approve new 25-year franchise for Oklahoma G&E by a margin of about 30 to 1.

Electrical appliances, machinery and equipment sales in 1952 will taper off only slightly from the record sales peak of $12 billion set in 1951, NEMA's Managing Director W. J. Donald predicts.

Community Public Service gets New Mexico PSC approval to up rates about 10% on average for home users and 15% for commercial customers. The increase will amount to $144,334 a year, of which $76,723 will go for taxes. "If it were not for the large tax burden, the company probably would have gotten by without a raise or at most with a small one," PSC Chairman L. W. Leibrand says.

Production of bituminous coal in 1951 will be approximately 4.5% greater than in 1950.

Hartford Electric Light Co hit its 1951 peak on Dec. 27 with a load of 253,600 kw. Its prediction was 252,000 kw. This was for the interconnected system, including Connecticut Power and the firm sales to Western Massachusetts Electric Co.

Arkansas P&L announces plans for $90-million construction program in 1952-56 with $27 million in 1952.

Metropolitan Edison takes option on 78.5 acres of land along the Delaware River, south of Portland, Pa., for possible erection of 600,000 kw power plant.

Two-way radio communication between industrial truck fleet and a centrally located dispatching office at Westinghouse Appliance Division Plant, Mansfield, Ohio, greatly speeds up interplant shipments.

Universal announces new super-type home vacuum cleaner, having 1-hp universal motor.

West Penn Electric will ask bids around Jan. 18 on 440,000 common shares to be offered to stockholders record about Feb. 1 in the ratio of one new share for each eight shares held . . . British Columbia Electric sells $20 million first mortgage bonds 3¾% due 1976 to U. S. investors.

Jan Riva Rojas of Mexico's Electrical Workers Union urges presidential nominee of the government party, Adolfo Ruiz Cortines, to nationalize all electric power companies as the only means towards industrializing Mexico.

Congratulations—Charles L. Derrick, superintendent of engineering since 1950 for Hartford Electric Light Co, has succeeded Fred D. Knight as vice president of the utility. Knight retired as vice president Jan. 1 but has been retained as operating consultant . . . Owens-Corning Fiberglas has elected John Marshall Briley vice president . . . Eastern League of Western Pennsylvania has named Bernard D. Levaur, vice president of Pittsburgh Reflector Co, president for 1952 . . . Brewer-Titchener Corp has elected James H. Greene president.

MORE ELECTRICAL WEEK

Final version of the proposed power marketing contract for 13 electric companies was presented to Administrator Douglas Wright of Southwestern Power Administration by Pres. Frank M. Wiles of Southwestern G&E. Before becoming effective, the contract must be approved by Interior Secretary Oscar L. Chapman, who is in charge of marketing power from federal projects. Further, the companies also must work out an intercompany agreement to carry out their part of the marketing contract.

Total central station capacity on Dec. 1 was 75,193,948 kw. EEI's tenth semiannual power survey estimated capability for the peak period at 74,925,000 kw.

Westinghouse Electric will spend over $3 million to provide nation-wide TV and radio coverage of two major Presidential nominating conventions and election campaigns in 1952 over Columbia Broadcasting System networks.

A 132-kv 3-mile tie line between Public Service E&G's Camden switching station and Philadelphia Electric's Richmond generating station went into operation on Dec. 29 with microwave equipment being used for protective relaying on 960-mc channel.

Alberta completes natural gas line from Foremost, Alta., to Montana Power's lines in Shelby but can't deliver natural gas until FPC gives its approval.

Southern California Edison Co had a peak of 1,543,000 kw versus 1,550,000 estimated and the west group of the Northwest Power Pool (Pudget Sound P&L, Pacific P&L, Portland GE, Tacoma and Seattle, Washington WP, and City of Eugene) 4,296,000 kw peak versus 4,482,000 kw estimated.

General Electric reports (1) The first usage of 1,100 F will be made in 1952 on two 145,000 kw units now being built for Public Service E&G; (2) five machines rated 176,470 kva at one-half lb hydrogen pressure are being built using Condal, a new aluminum alloy; and (3) orders are on hand for eight generators requiring thrust bearings capable of supporting a 4 million-lb load, largest ever to be carried by a generator thrust bearing.

IN THE INDUSTRY

From Washington State to Washington, D. C., the sale of Washington Water Power Co to a group of public utility districts was still making news as this issue went to press.

In Spokane a newspaper announced that Fred Ashley, a local real estate broker, had agreed to act as an organizer for a "non-profit membership corporation." This is the answer of Howard Aller, president of American Power & Light Co, to legislation prohibiting control of electric properties in Idaho by public authorities in other states. The non-profit group would take over the Idaho portion of the WWP system, the water system in Clarkston, Wash., and any Washington electric properties not desired by the PUD's.

It was such a "citizen's committee" that took over the Nebraska Power Co from AP&L and later sold it to the Omaha Public Power District. The rumor is that the "non-profit corporation" would be incorporated under the laws of Delaware. In addition to Ashley it is expected that two other Spokane businessmen and two from Idaho will make up the organizing committee.

Electric Bond & Share Co, the New York holding company owning 183,050 shares of AP&L, wired its protests to the Securities and Exchange Commission. Pres George H. Walker, signer of the telegram, said:

"The public utility districts urge that you are without jurisdiction because of the alleged ultimate future ownership by the public of all of Washington's property. This is specious since the same papers indicate that such a development could not take place for years, if ever."

In Washington the SEC had a number of other messages urging it to assert jurisdiction. But if the sale is, in fact, to public bodies, it would have no power. A sale to the non-profit corporation would be different. SEC could assert jurisdiction but had only to last Saturday to act.

An order calling a hearing on the jurisdiction issue would have been all SEC had to do to protect its rights.

TECHNICAL NOTES

ARCHER E. KNOWLTON

River crossing spans announce their presence to aircraft by means of mid-span neon lights energized inductively from the line power.

Fiber glass reinforced plastic spools are being used in the textile and rubber industries. Why not feasible for wire and cable reels?

Auxiliary power requirements for pulverized coal installations increase sharply as the quality of the coal deteriorates. Those for stokers hardly change. For a lignite plant at 125% rating the ratio was practically 10 to 1.

Crystal detectors, copper-oxide and selenium rectifiers were early forms of semi-conductors now dubbed varistors.

Selenium rectifiers have supplanted the copper oxide type in some applications where lighter weight and smaller volume are dominant requirements.

Pumped-hydro means an ordinary hydro-electric generating station saddled with extra charges for pumps, motors, valves, piping, switchgear, and outside power for pumping; despite the handicap there are justifiable situations.

Ripple control on a South African power system turns water heaters and street lights on and off selectively, spreads a general alarm, and affords two spare channels for emergency or future functions.

Distribution transformers of the EEI-NEMA standard pattern have risen only 60 to 70% as much in cost as electrical apparatus generally.

Use More Aluminum Less Copper . . .

. . . That's the advice of defense mobilizers at Washington. The electrical industry, a big user of copper, is taking that advice. But the hitch comes in the availability of aluminum. It is still in short supply and the industry is demanding more . . .

In the third quarter of 1951 Defense Electric Power Administration had difficulty getting rid of 3.2 million lb of covered aluminum conductor. In the fourth quarter utilities were clamoring for the 4.5 million lb which the agency had to allot. This quarter there are too many claimants for the 6 million lb available. So next quarter Depa will make a try for an even larger amount.

Almost all of this covered aluminum conductor is going to fill minor requirements of utilities—operation, maintenance, and repair needs. Depa estimates 60 to 65% of this is being used for service drops and some 30% for secondary lines.

It is estimated this shift from copper to aluminum already represents a 15% change poundwise. By the second quarter of this year the change may go up to 125%. This gradual increase in the use of aluminum accounts partly for Depa's cutback request for second quarter copper.

As far as controllers in Washington can determine, the increased use of aluminum to replace copper by the utilities is the largest-scale "metal substitution" in any industry.

But even the mobilizers can't push aluminum too strenuously. Copper is now scarce. But aluminum isn't too plentiful. Some mobilizers even assert that an expanded aircraft program could make aluminum scarcer than copper in the latter part of this year.

Meanwhile electrical equipment manufacturers have been studying their equipment to find where aluminum could do the job as well as copper. Often the manufacturers prefer to consider the materials replacing copper as alternatives rather than as substitutes. In many cases they say the new material is every bit as good if not better than copper. As far as they are concerned, the new material would stay even if copper were to become plentiful.

General Electric Co, which has been doing research for the past two years on aluminum alloys, takes this stand. Even now the company has replaced its brass lamp bases with aluminum. In smaller motors windings are now aluminum. Distribution transformers of one or two ratings with aluminum coils will soon go into production. Bus and connecting bars of aluminum for switchgear will come later. Windings for large motors and for generators are still in the research stage.

But it is in wire and cable, where considerable experience has been acquired in the use of aluminum, that the industry has made its greatest strides in reducing the use copper. Here is the picture presented by several such companies:

Rome Cable Corp—"Bare aluminum conductor can be insulated interchangeably with copper on the same equipment. The curtailment in copper compared to wire mill capacity has therefore accelerated activity on aluminum in most sections of the wire and cable industry.

"Rome Cable has carried on a considerable amount of research and experimental work covering many types of aluminum insulated wires and cables. We believe it lends itself very well to aerial and overhead types such as weatherproof wire or service cables. Second, underground cable for low voltage power use and low voltage insulated wires for general construction in sizes 1 and larger and possibly in sizes as small as 6 AWG.

"We feel that the extreme urgency of the present emergency could well overdo the substitution of aluminum for copper. Projected increased supply of copper for the future should still find plenty of necessary peacetime uses in the wire industry. However, the large supply and lower relative cost of aluminum should make it economically desirable for use in many applications now preempted by copper.

"We definitely feel that there is a permanent place for aluminum in the insulated wire and cable industry if it is applied where industry experience will aid it as a sound development which can have permanent value. We do feel that there is some danger by over enthusiastic application of forcing it into places where it is not technically suitable or where even if suitable cannot perform as satisfactorily as copper."

Okonite Co—"We believe that there are a great many places where insulated aluminum conductors can be used to advantage. For nearly five years we have been supplying insulated cables with aluminum conductors. These have been ordered because of their greater availability as compared with copper, their lower cost, or their light weight and ease in handling.

"Now many users are ordering such cables for another reason, that is primarily to gain experience in their installation and operation. These buyers, looking into the future, realize that there will not be enough moderately priced copper available for all electrical needs in the near or foreseeable future.

"Early in 1947 when we first realized there was a growing scarcity of cop-

per, we initiated research to determine the best methods for jointing and terminating aluminum conductors in insulated cables. We also put many types of wire and cable into production and encountered no significant problems.

"We believe that the principal use of aluminum in insulated cables will lie in the larger sizes (6 AWG and over) simply because they offer more opportunities to realize its advantages and economies. We have supplied aluminum for practically all types of cables. Recently we received what we believe is the first order ever placed for paper insulated power cable. We have supplied many hundreds of thousands of feet of cable insulated with rubber or varnished cambric.

"We have concentrated primarily on insulated power cables such as interior or underground cables and self-supporting aerial cables. We do not believe aluminum conductors will be likely to find extensive applications in the signal and control cable field or in domestic or branch circuit wiring where no significant advantages can be gained."

Kerite Co—"The present shortage of copper and the definite trend of metal allocations has compelled us to foster the use of aluminum for many circuits where the poundage of copper saved by so doing is appreciable. We have no recourse in this matter, and in most cases the users of our cable realize this and are cooperating to a high degree. We have made insulated aluminum conductor as long ago as 1927, and we look for no manufacturing difficulties whatsoever."

John A. Roebling's Sons Co—"We plan to augment our production of electrical wires and cables by utilizing aluminum as well as copper for conductor for a number of specified end-product applications.

"We believe aluminum insulated conductors will have a definite place in the overall usage of electrical wires and cables. Accordingly our present plans call for us to introduce aluminum conductors into our production of electrical wires and cables in accordance with the following pattern:

"1. We do not intend to manufacture bare aluminum transmission conductor. We will confine our efforts to the application of aluminum to electrical systems as insulated conductors.

"2. We intend to manufacture Type SS neutral supported service drop cables with aluminum conductors, using both Neoprene and Polyethylene as insulations. A substantial amount of this type of product is already in service.

"3. We intend to manufacture both Neoprene and Polyethylene insulated aluminum line wire for overhead distribution. This product, we believe, will ultimately entirely supplant the conventional weatherproof copper wire, Type URC.

"4. We intend to manufacture insulated aluminum parkway and network cables for low voltage service. Despite the fact that aluminum conductors must, in general, either be of larger diameter or operate at higher temperatures than copper because of conductivity differences, there are advantages which we believe offset such disadvantages. For instance, aluminum does not corrode under rubber compounds, and unlike copper requires no tin coating on the conductor. Too, aluminum network cables require smaller size messenger cable.

"The use of aluminum versus copper for electrical conductor on a long term basis in our opinion, however, is strictly a matter of economics. If both are available, then in the final analysis the choice will be one primarily based on relative cost to the consumer."

Simplex Wire & Cable Co—"There seems to be no question that in the immediate future a considerable amount of aluminum will be used by both public utilities and industry for a great many varying services. Our plans regarding the use of aluminum depend on two factors: (1) The acceptance of our customers of this metal, and (2) the availability of the material itself.

"Ever since 1936 this company has used aluminum in varying degrees. One of our largest testing grounds has been our own plant. Here we have installed power and control cable of various voltages in many different service conditions. These installations include a number of different designs and constructions to fit the operating conditions. These services are as open wire, on racks, in underground duct, as aerial cable, and others. Both wet and dry locations are included. Various types of terminations and joints are also in service."

Anaconda Wire & Cable Co—"We are presently making ACSR for overhead lines, aluminum line wire and service cable, as well as insulated aluminum cables of various kinds. If the demand for aluminum conductors grows, so will our capacity to manufacture grow. We don't see any great fabricating problems as far as we are concerned.

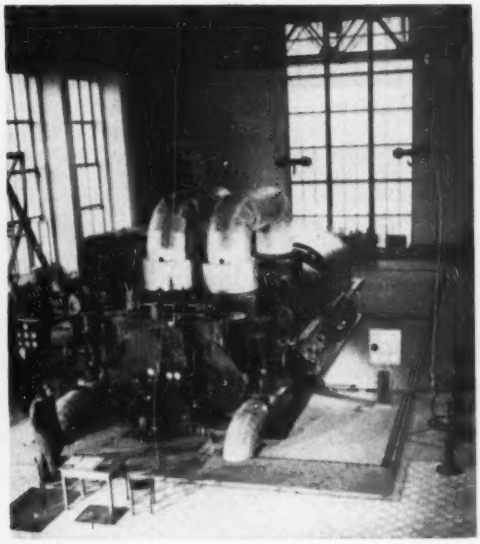
"The big problems fall upon our customers. They must solve the problems of engineering the end use of the wire and cable as well as those of jointing, cost of other components, space factors, and similar matters.

"We do feel that some persons have allowed the pendulum to swing too far in advocating the substitution of aluminum for copper. The spread between scarcity and plenty usually turns out to be a narrow one. If people are not careful, they may find themselves in the position of having spent considerable time and money in engineering new construction or new apparatus only to find that there is sufficient copper for their use after all."

Aluminum Output Running as Copper Walks

The Aluminum Association estimates that in 1952 over 2 billion lb of primary aluminum will be produced in the United States. In 1951 the estimated total was 1.68 billion lb. In addition there were imports estimated at 250 million lb. These may increase by a small amount this year. But present production facilities of 1,743,500,000 lb annually will be increased to 2,590,500,000 lb by the end of the year, and to over 3 billion lb by the end of 1953.

Copper industry executives estimate that in 1952 about 125,000 tons of copper will be available for domestic consumption each month. This would come from domestic mines, imports, and intake of scrap by custom smelters. This total of 1.5 million tons is slightly more than the estimated 1.35 million tons shipped in 1951. There will be little increase in production facilities this year and only slight increases in 1953.



GERMANY will need many more power plants like this 140,000-kw Unterweser Station near Bremen before she is able to contribute much to Western Defense. The 60,000-kw unit at the right was installed recently with the aid of Economic Cooperation Administration funds

Power Deficit Slows German Defense

Tough fuel rationing system is needed if western sector's utilities are to supply enough power for military production

Far-reaching decisions, among them the implementation of a tough fuel priorities system, will have to be made this year if Western Germany's electric utilities industry is to play a vital role in Western European rearmament.

Cold statistics prove that, although there has been roughly a 20% rise in power output and consumption, the same sizable deficit in electric power exists today which existed last year at this time.

Shortage grows . . . In 1952, Germany will be short 1,500 Mw, while in 1953 this figure is expected to rise to 2,000 Mw.

Actual capacity on Jan. 1, 1951, was 6,901 Mw in 276 stations; by July 1, 1951, capacity had increased to 7,250 Mw in 286 stations.

At the end of 1951, capacity was estimated at 7,900 Mw, while the goal for the end of 1952 stands at 8,400 Mw.

Some new machinery and stations have been installed, but it is pointed out that the additional power produced has barely been able to fill demands from industry and the public. Actually, only 1 to 2% of obsolete equipment has in the past year been replaced by new machinery. New equipment has largely been installed with the aid of Economic Cooperation Administration funds.

The German federal government, under its "investment aid program," has tentatively earmarked 300 million Deutsche Mark for new utility construction.

The increase in demand and consumption of electric power in Germany is of course due to the rapid rebuilding and expansion of German industry. Rebuilding of private homes and the corresponding increase in electrical appliances has also boosted consumption. An acute example of this latter drain on available electric power is the fact that many Germans are buying and using electric stoves and ranges, motivated by fear of a critical coal shortage during the winter months of this year.

Long-range plans for improving the electric power shortage in Germany include:

1. Utilization of lower grade fuel, such as brown coal and low-grade hard coal in the Cologne and Ruhr areas respectively, accompanied by the construction of added stations to handle this fuel.

2. Installation of additional hydroelectric power stations in Bavaria, especially on the Inn, Lech, and Isar rivers. At the moment, funds for these projects are not available.

Two Ways . . . If this year is to see the harnessing of Germany's industrial capacity into the West European defense effort, only one double-barrelled alternative seems available:

1. Rationing of power, imposed on the ultimate consumer.

2. A tough priorities system in the fuel field, primarily aimed at hard coal.

Both steps will be unpopular and run counter to the "free economy" philosophy expressed by the Minister of Economics.

AEC Lab Produces Electricity

Small amounts of power generated as a by-product of breeder reactor experiments at Idaho testing station

Moving slightly ahead of schedule, the Atomic Energy Commission's Idaho reactor testing station has begun to produce small amounts of electricity as a byproduct of its breeder reactor experiments.

AEC Chairman Gordon Deane said early in December that some electricity might be produced by the experiment in the first half of 1952 (EW, Dec. 17, p 74). However, AEC has announced that in a trial run on Dec. 21 and 22, electrical power of more than 100 kw was generated by heat from the breeder reactor. It was thought to be the first power ever to be produced in this way.

The electrical energy was used to operate pumps and other reactor equipment and to provide light and electrical facilities for the building that houses the reactor.

Tests to continue . . . The commission expects to resume its test operations early next year after further adjustments of the reactor system.

Heat energy generated was removed from the reactor by a liquid metal at a temperature high enough to generate steam to drive the turbine. The electric power generation phase of the experiment is incidental to the reactor study. It is not contemplated that large amounts of electric power will be produced as a part of the experiment.

However, these test runs of electric power production may provide a useful tool for carrying out further experiments along this line. AEC gave out no cost figures on energy generated in this manner, and Dr Walter H. Zinn, supervisor of the Idaho laboratory, said no cost comparison should be made between cost of power production from this reactor and from conventional sources.

Can't consider cost . . . Cost was not an essential factor in the power phase of the Idaho reactor and the experiment clearly was not intended to indicate the economic feasibility of producing electric power from nuclear sources.

Total cost of the reactor breeder at the Idaho laboratory was about $2.7 million. In addition, AEC spent about $2.5 million for research and engineering development on the project over a four-year period.

The reactor and its principal components were erected at the Idaho station by the Argonne National Laboratory.

AEC sent its congratulations to Dr Zinn and his associates. General Manager Marion W. Boyer said successful operation of the breeder was evidence of the thorough and capable work which has gone into the program.

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'Better Copy Contest' Entries Are Due Feb. 1

Entries for the 1952 "Better Copy Contest" of the Public Utilities Advertising Association will close Feb. 1. The only exception is annual reports which may be entered up to April 1.

The contest, which is the oldest continuously conducted advertising competition in the country, is open to all investor-owned electric, gas, and transportation companies. Membership in the association is not necessary, and there is no entry fee.

There will be 174 awards in 22 classifications. Many are subdivided to permit companies to compete against others of the same size. All award-winning entries will be reproduced in a single printed volume which will be available at cost early in May.

Rules books, containing complete instructions for entering the contest, are available from Charles D. Lyon, contest chairman, Potomac Edison Co, Hagerstown, Md.

Index Is Available

Electrical World's semi-annual index has been prepared and copies are now available upon request. It may be obtained without charge. Address requests to Electrical World, Editorial Office, 330 W. 42nd Street, New York 18, N. Y.

MARION F. HETHERINGTON recently took over as assistant chief of FPC's Bureau of Power. He succeeded Francis L. Adams, who moved up to chief last June

Anaconda-Harvey Plant to Receive BPA Power

Under terms of a contract with Bonneville Power Administration, the Anaconda Copper Co-Harvey Machine Co aluminum plant to be built at Kalispell, Mont., will receive 111,000 kw of firm power for three potlines, and possibly another 37,000 kw of interruptible for a fourth, from Hungry Horse Dam.

These figures compare with 142,000 kw firm and 24,000 kw interruptible power at Reynolds Metals Co's Troutdale, Ore., plant; 132,000 firm and 45,000 interruptible at Aluminum Co of America's Vancouver, Wash., plant; and 189,000 firm and 117,000 interruptible at Kaiser Aluminum & Chemical Corp's Spokane plant.

The schedule for Kalispell calls for 37,000 kw by May 1953, another 37,000 by September 1953, and an additional 37,000 by September 1954, all firm power. If Hungry Horse Dam capacity is sufficient the plant also will get 37,000 kw of interruptible power by September 1954.

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Public Service in Pool

Public Service Electric & Gas Co, Newark, N. J., is a member of a power pool established recently by utilities in New York, New Jersey, and Pennsylvania (EW, Dec. 24, p 12). The company's name was omitted inadvertently from the list published by EW two weeks ago. Public Service was one of the prime movers for setting up the pool.

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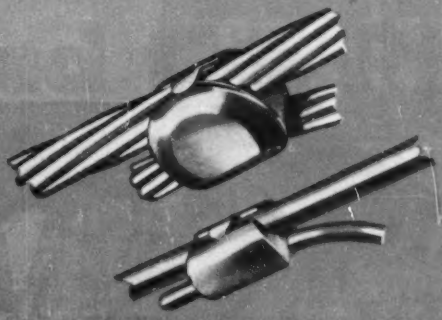


NOW Reduce Your Connector Cost by 50% with the New Kearney SQUEEZON

A Completely New Type Connector That Eliminates Contact Corrosion

In the face of rising costs throughout the industry, management men will appreciate the savings effected through this advanced design connector.

The men in the field too approve of the many advantages provided in this revolutionary method of line connections. The results are better—installation is easier.

Here's How It Works . . . A CLICK—and It's Done!

The KEARNEY SQUEEZON is a pure copper compression-type connector forged in a shape having an "H" cross-section. The connection is made by placing one conductor in the top half of the "H" and the other in the bottom. The sides are then coined over under tremendous hydraulic pressure—applied by pumping one handle of the SQUEEZON Tool. When a distinct click is heard the connection is then complete, permanent and a perfect electrical bond.

WRITE TODAY for the big, 8-page bulletin on the Squeezon.

JAMES R. KEARNEY CORPORATION
4226-42 Clayton Avenue • St. Louis 10, Missouri
Canadian Plant: Guelph, Ontario

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

KEARNEY *Gives a Little More for a Little Less*

Through Engineering

ALLIS-CHALMERS Switchgear Protects

IT TAKES electric power not only to operate finished telephones, but also to build them — for factory lighting, ventilation, cooling, and a multitude of processes and machines.

How Power is Distributed at Western Electric Plant

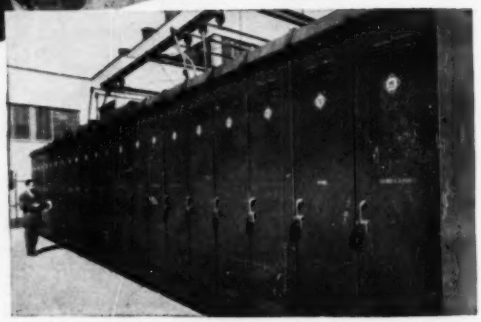
FLEXIBLE PRIMARY DISTRIBUTION

Electric power for the plant is obtained from a loop circuit supplying this industrial region, and feeds are taken from two power company substations to assure uninterrupted service. This precautionary duplication is continued in the primary distribution.

The 4160-volt outdoor switchgear itself consists of two main divisions. Each division is supplied by one feeder, and either can deliver power to any of the distribution lines. The two divisions are inter-connected by a bus-tie breaker.

ON-THE-SPOT SECONDARY DISTRIBUTION

The secondary distribution is accomplished with nine 500-kva lighting substations, eight 1000-kva power substations, and a 2000-kva boilerhouse substation. Six each of the power and lighting substations are paired together in six of the penthouses on the roof of the manufacturing building. These supply the main floor without utilizing valuable manufacturing floor space. Two more units are located on the lower floor of the building to supply that level with low voltage requirements. The remaining lighting substation is in the basement of the office building.



OUTDOOR SWITCHGEAR, adjacent to boilerhouse, feeds indoor substations and large high-voltage motors. Includes seventeen 1200-amp DZ-100B feeder oil circuit breakers and three 2000-amp DZ-100B main and bus-tie oil circuit breakers.

ALLIS-

FIRST IN THE U. S.

the Power Behind the Phone

AT Western Electric INDIANAPOLIS PLANT

SHUT-DOWN of the world's largest telephone-set manufacturing plant could cause a great loss in vitally needed production. To avoid such losses, Western Electric required a flexible but reliable power distribution and protection system for their giant new Shadeland Avenue plant at Indianapolis, Indiana.

To fill this requirement, Allis-Chalmers supplied a high-voltage primary-selective and low-voltage secondary-selective distribution system that is practically fool-proof. It would take the almost impossible simultaneous occurrence of four faults to throw this system out of order and cause a shut-down.

This Western Electric plant uses almost as much electric power as a community of 35,000 persons. The way this power is distributed is described on the facing page.

Adaptable to Your Needs

When you need power distribution equipment, it will pay you to follow Western Electric's example. Allis-Chalmers switchgear is standardized in basic design features for low initial and installation costs. But it is highly flexible in construction details and can therefore be built to suit every installation requirement.

Allis-Chalmers switchgear combines all elements for reliable circuit interruption with full safety to operating personnel. Safety features begin with a rugged, lap-welded, rigid steel enclosure with protective compartments. Interlocks and shutters provide positive safety to operators.

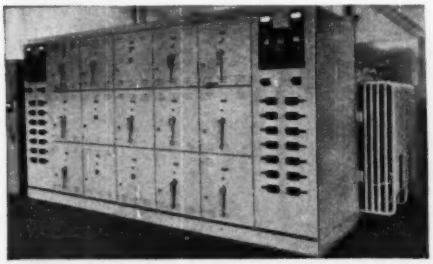
These same features plus many other details mean long, trouble-free operation. Attention to details is also characteristic of the circuit breakers themselves.

The G-50 low-voltage air circuit breakers used in the substations at the Western Electric Indianapolis plant have silver main contact tips and silver-tungsten arcing contact tips for good conductivity and low maintenance. Type DZ high-voltage oil circuit breakers are designed for low total arc energy to minimize oil and contact deterioration.

Information Available

Whether you need a complete new distribution system or a single breaker for increased capacity, your Allis-Chalmers representative can help you obtain maximum protection and reliability at minimum cost. Ask for general bulletin 18B6185A. It will provide you with a quick summary of the range and features available in Allis-Chalmers switchgear. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3455

Chlorextol is an Allis-Chalmers trademark.



DOUBLE-ENDED 2000-kva LCS unit substation in boilerhouse has 1600-amp G-50 main, 1200-amp G-50 bus-tie, 600-amp G-50 feeder air breakers. Chlorextol liquid filled transformers are 4160-480Y/277 volts, 1000 kva self-cooled, 1250 kva forced-air-cooled.

PENTHOUSE installation of 500-kva (left) and 1000-kva (right) LCS unit substations. Lighting unit has 4160-208/120-volt transformer, 1600-amp main and tie breakers, 225-amp feeder breakers. Power unit has 4160-480Y/277-volt transformer, 2000-amp main breakers, 1600-amp tie breaker, 600-amp feeder breakers.

CHALMERS

WITH METAL-CLAD SWITCHGEAR

The best way to deal with insulator trouble here is NOT TO HAVE IT!

That's Why British Columbia Electric Railway Co., Ltd. Chose O-B

Reputed to be the roughest territory in the Dominion of Canada, and perhaps on the American Continent, is the 130-mile stretch northeast of Vancouver through which British Columbia Electric Co., Ltd. built its new 230-kv transmission line to the Bridge River Hydro plant. Access to most parts of the line is so difficult that helicopters are used for inspection and patrol. . . Here's no place to send a service truck for line repairs. The best way to deal with trouble in this territory is *not to have it!* And, with this thought in mind, B. C. Electric obtained suspension insulators from Canadian Ohio Brass Co., Ltd. for this spectacular project.

Ohio Brass

MANSFIELD • OHIO

Power Shortage in Nevada?

It all depends on whether utilities can find way to meet demand of Basic Magnesium plant in southern part of state

Rapidly expanding defense production at the big state-owned Basic Magnesium Industries plant in the Las Vegas area may soon create a power shortage in southern Nevada.

Officials of the Nevada Colorado River Commission, which has charge of power allotments in that area, have said they are facing a shortage of 300 million kwhr in 1952, and a search for additional sources of electricity has been ordered.

Nevada's share of power allotments from Hoover Dam and Davis Dam have now been contracted for in full, and A. J. Shaver, chief engineer for the commission, says supply will fall far short of the need. The contracts call for 741 million kwhr annually from Hoover Dam and 236,000 from Davis Dam.

Ban Is On . . . This power allotment has been distributed among the utilities operating in Clark and Lincoln Counties, and its inadequacy has caused contractors in the Las Vegas area to ban any further construction of homes to be heated by electricity.

Under the direction of Gov Charles Russell, a survey of power resources in California and elsewhere has been undertaken, but the results have not been encouraging. It was reported that in California additional steam plants are under construction, but only for the purpose of taking care of increasing demands in their own localities. They would have no power to sell to Nevada.

From Shasta? . . . It is probable that attempts will now be made to get power from Shasta Dam in northern California for the southern Nevada area. Sen George Malone has advocated such a program for the last few years, and says he has obtained a commitment from the Interior Department for 150,000 kw from Shasta, on a 50% load factor, which would make available 657 million kwhr annually of firm Shasta power as soon as the Nevada Colorado River Commission signs the necessary agreement.

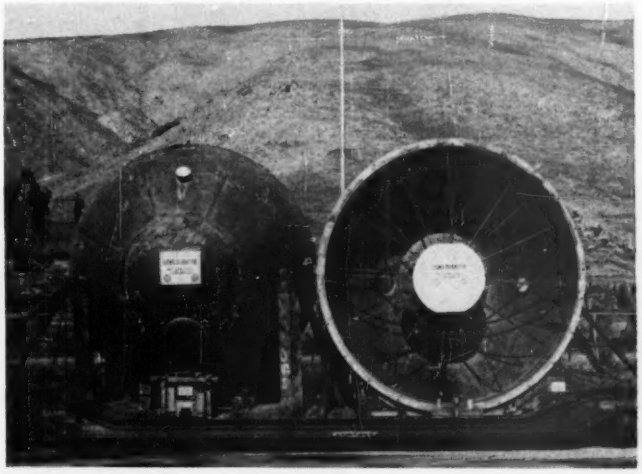
It is estimated that the power from Shasta could be delivered to the southern Nevada area for from 6 to 6.5 mills per kwhr. Bureau of Reclamation engineers have estimated the power could be delivered under a normal wheeling and transfer contract with two private companies. This, according to Malone, is standard practice, and Pacific Gas & Electric Co and Southern California Edison Co could handle it.

(In Sacramento, bureau spokesmen told an Electrical World reporter that while the 150,000 kw was available, correspondence with PG&E had indicated that the company had no interest in permitting the government power to go into Nevada over its lines. The wheeling contract in existence between the bureau and the PG&E requires PG&E permission to wheel to any place outside the California central valley.)

Malone said Nevada would undertake no financial obligation under the offered contract until such time as it may transfer the power to a power company or other organization within the state in the same manner as Hoover Dam power.

Lose City Light Claim

Lumber interests which claimed their log rafts were damaged by release of waters from two hydroelectric dams of Seattle City Light have lost a $13,111 claim against city. The companies charged the city failed to take reasonable precaution in controlling waters of the Ross and Diablo Dams on the Skagit River. Judge John C. Bowen, in Federal District Court at Seattle, rendered a decision in favor of city.

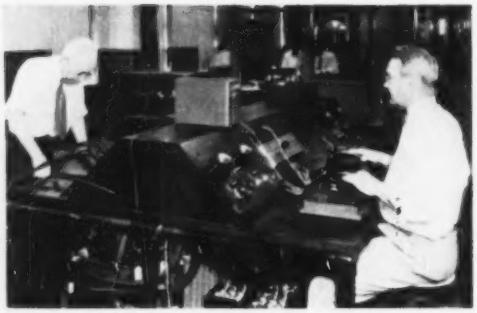


Test Heads Head for Ross Dam

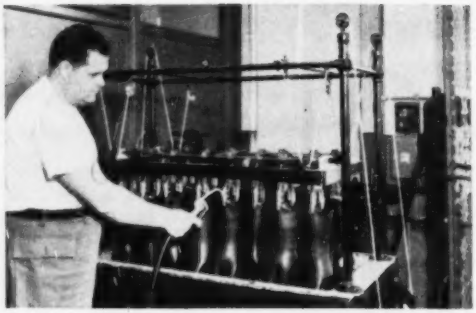
Couple of steel bowls on the flatcar will be used to find out whether the four penstock lines at Seattle City Light's Ross Project on the Skagit can withstand heavy water pressure.

The test head at the left will be bolted on the downstream ends, that at the right, on the upstream. Then pressures up to 289,530 lb will be exerted on the water inside the 225-ft lines to determine their strength and tightness.

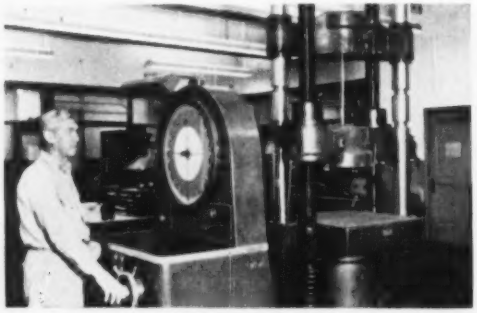
The heads, weighing more than 16 tons each, vary from 1⅛ to 2 inches in thickness. They were made by the South San Francisco Plant of Consolidated Western Steel Corp, a U. S. Steel subsidiary. They were shipped recently to the hydroelectric project, near Bellingham, Wash.



1 Public Service E&G's test lab includes large electrical division. Here, engineers standardize precision ammeter

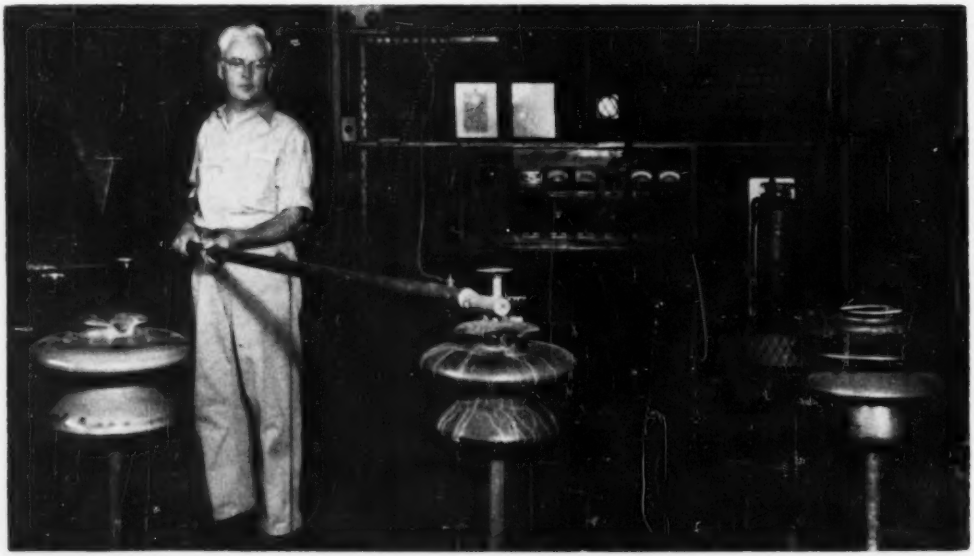


2 Materials Division protects linemen by checking their rubber gloves periodically with high-voltage device filled with water



4 Load indicator exerts force of 100,000 lb psi to determine tensile strength of steel specimen used in the utility's system

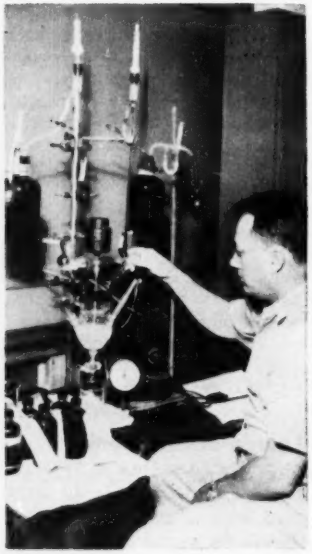
5 Humidity chamber in Electrical Division is used to test current leakage of appliances and equipment sold in company's outlets



7 Technician in high tension room uses a 170-kv high frequency oscillator (left) to test 26.4-kv pin-type insulator. If spark passes around the insulator, it is approved for service. Spark passing through indicates there is a fault in the porcelain

3 Chemist checks paint specimens on exposure rack on lab room semi-annually

6 Field crew uses holiday detector on pipe being laid at Ridgefield, N. J.



8 Chemical Division technician checks moisture content of transformer oil

Call the Testing Laboratory . . .

. . . if there's anything to be checked. That's the rule at Public Service E&G, and here's how it works

Public Service Testing Laboratory tests everything that goes into the system—and the annual cost of that sort of operation today is pushing up toward $1 million.

"You can't justify test work on the cost of equipment or the volume of material tested," Howard C. Miller, chief laboratory engineer, said recently. "Test cost on one piece of equipment is all out of proportion to the volume installed. But if the material failed, and because it did, a man was killed, we'd feel that was much more costly."

PSE&G's lab at Maplewood, N. J. is one of the few buildings in the country that **does** handle every bit of a utility's testing work—from the rubber gloves its linemen wear to the supervisory control equipment being installed in the utility's Kearny steam electric generating station.

Work Divided. . . Four major divisions divide up the work: electrical, chemical, mechanical, and materials, and there is a service division to keep them operating. More than 6% of the 170 employees, most of whom are members of the International Brotherhood of Electrical Workers, AFL, are actually engaged in engineering work.

The big things the lab does are pretty obvious, like sending 45 men to Sewaren to check a new 145,000-kw unit from boiler to control panel. But it costs close to $1 million just to **paint** Sewaren Plant, and so Testing Lab has another, less obvious, job: developing and testing longer-lasting paints.

Routine and Special. . . Day-to-day tests, for which no special requests are made, keep the lab operating at a steady pace. As a matter of routine, the chemical division checks the Btu content of each tanker's load of oil, of each 2,500 tons of coal. Requests from various departments in the system add to this work load. Right now, for instance, the staff is studying the use of fly ash in concrete.

"We have a third responsibility," Miller commented, "and that is developing modifications and improvements in test methods—we work closely with industry bodies on this."

A huge amount of material passes through the lab for test before it is placed on an approved list for the purchasing department. In a year's time, the staff checks 15 million feet of wire, 2,000 concrete samples, 160,000 glass and porcelain insulators. One man from the lab is kept on a roving assignment in the South checking 26,000 pine poles a year.

Storehouse. . . The modern, yellow-brick building serves as a storehouse for the utility's state stock of meters, relays, and switchboard instruments. All are checked on arrival and held for new construction or replacement.

Seven trucks and 25 passenger cars take field test crews out on routine and emergency jobs.

Because of emergencies, the utility sometimes has to accept substitute materials. At Public Service, what substitutes are used are primarily the responsibility of the engineering groups that must use the materials. Normally, Miller said, these groups ask Testing Lab to check the substitutes and give advice on their use.

"We may have to go to aluminum wire in place of copper leads into homes," he said. "We're looking into that now."

Effect of Korea . . . Surprisingly, last year's tests did not lead to any large increase of rejections that could be laid to speedup in production caused by the Korean War. "The speedup, with resultant improper wiring and the like, has not been nearly so great this time as during World War II. Then, we had to rebuild some new products here, rather than send them back, because to send them back would have involved time delay."

He indicated he hoped the lab wouldn't have to cope with that kind of thing again.

Mobile Home for Relief Operators

The care and feeding of relief operators whose duties take them far from home for several days at a time is no longer a problem for the Washington Water Power Co of Spokane, since they took delivery of the mobile "home" shown.

Designed to company specifications and built by Novelty Carriage Works of Spokane on an International "Metro" COE chassis, the vehicle supplies 72 sq ft of living space for the operator, Charles Schaffner, during his stays of five days each at various substations and generating plants. Replacing a trailer, the unit is wired for local electric service and has piping for water service.

Harold Halstead, the builder and Harold Besgrove, WWP garage foreman, are shown looking over the vehicle at time of delivery.

Use of Tides for Power Studied in New Zealand

A plan to harness the rise and fall of the tides to produce electricity is under consideration in New Zealand.

Tides in the Waitemata and Manukau Harbors have been mentioned. The plan envisages twin pipelines across the narrow strip of land that separates the two harbors, with a powerhouse in the middle. The Waitemata tide has a 9-ft rise and fall and the Manukau tide a 14-ft rise and fall.

These tides operate at different times—when it is high tide at one harbor, it is low tide at the other. One pipeline would drop slightly from the Waitemata Harbor to the Manukau and the other would do the opposite.

Water would flow from Waitemata to Manukau twice daily while the Waitemata tide was coming in through one pipeline and the other way through the second pipeline while the Manukau tide was coming in. Thus the flow of water would be continuous, enabling the powerhouse to operate around the clock. This type of installation would eliminate the need for expensive dams and should be substantially cheaper than the river works now in use.

Northwest Area Offices Established by BPA

Under Bonneville Power Administration's program for decentralization of operation and maintenance responsibilities, area field offices in major Pacific Northwest load and power centers were established last week.

Effective Jan. 1, four of the present seven district offices received area status and three were continued as district offices, with only minor shifts in personnel.

Bonneville's Portland offices retain primary responsibility for policy determinations, power grid construction activities, Columbia Basin interagency programs, system engineering, regional, fiscal and legal functions, and other activities having primary relationship to the main grid. Dispatching headquarters for Bonneville's major grids was continued at J. D. Ross substation, Vancouver, Wash., but eventually will be supplemented by area dispatching offices at Eugene, Ore., and Pasco and Snohomish, Wash., to handle localized dispatching and operating problems.

Commenting on the decentralization program, Administrator Raver said:

"Growth of the Columbia River power system to one of the nation's largest utilities, with over 4,400 circuit miles of high voltage transmission lines and 123 substations, makes planning of added responsibility for operation and maintenance under area offices mandatory for most efficient and economical power service. Physical extent of the system and diverse conditions over the region make it impractical to funnel all power operations and maintenance through the Portland headquarters."

At the same time, Dr Raver explained, steps will be taken to strengthen the present load estimating and customer service programs carried out through the area and district offices.

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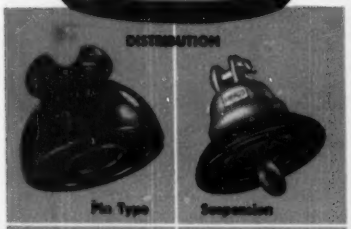
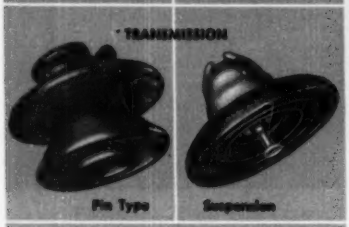
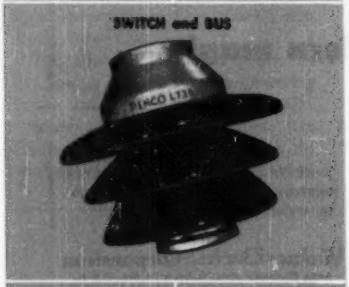
Toledo Edison Boosts Pay

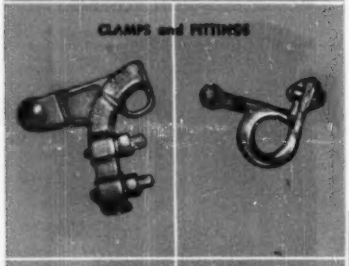
Toledo (Ohio) Edison Co has granted 1,016 distribution and operational workers a wage increase of 3¼%. The average boost, effective Dec 10, amounts to an increase of 6¢ an hour.

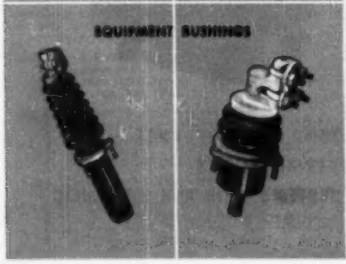
PINCO
INSULATORS











A few years back, all switch and bus units were made with a short second shell which invited the possibility of cascading in stacks. That is, up until Pinco introduced the revolutionary new L 735 switch and bus stacking unit. With rugged porcelain, a larger second shell and an improved center design, this new unit showed far superior flashover performance and greatly reduced the tendency to cascade. It also provided added leakage protection and increased mechanical strength.

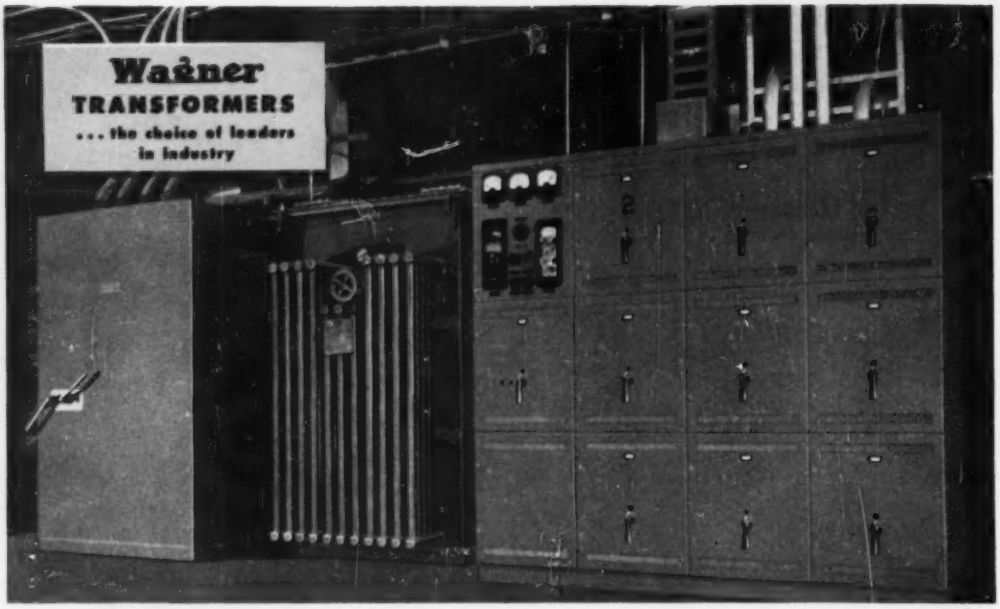
Today, this idea like many others pioneered by Pinco, is an accepted industry standard . . . further evidence that Pinco is constantly primed to keep abreast of industry requirements. So whether your insulator requirements are ordinary or extraordinary—the services of the entire Pinco organization are yours to command.

See Page 118 Pinco Catalog No. 49 for complete electrical and mechanical specifications.

The Porcelain Insulator Corporation
766 Main St., Lima, N. Y.
Sales Agents: JOSLYN MFG. & SUPPLY CO.
Offices in Principal Cities

PINCO
INSULATORS

Suspension Insulators . . . Switch and Bus Insulators . . . Distribution Clamps . . . Distribution Pin Types and Guy Strains . . . Transmission Line Fittings . . . Tree Insulators . . . Transformer and Circuit Breaker Bushings . . . One Piece and Multi-part High Voltage Pin Types . . . Suspension and Strain Clamps . . . Indoor Bus Support Porcelain . . . Lightning Arrester Porcelain.



Here's a yarn of modern magic...

American Enka Corporation makes synthetic textile yarn for use in many forms, ranging from the dinner-and-theatre dress that bedecks your lady to the tough rayon cord that gives greater safety and longer life to your automobile tires.

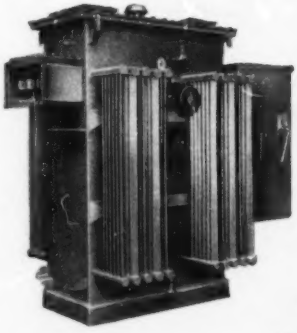
This business of transforming cellulose into man made fibers is one of our newest industries. And, like all modern industry, it depends on electricity as its source of power for production.

In the Lowland, Tennessee plant of the American Enka Corporation, this electric power is generated at high voltage and is stepped down to utilization voltage by Wagner Unit Substation Transformers, like the one pictured above—in one of fourteen Wagner-equipped unit substations in this plant.

Wagner Transformers are an important part of the equipment of many great industrial plants. In every case they are adding to their reputation for complete dependability . . . for unfailing service . . . that influenced American Enka to install Wagner Transformers.

Wagner engineers are qualified to specify the correct transformer for *your* requirements. Consult the nearest of our 31 branch offices, or write us.

Wagner Electric Corporation
6456 Plymouth Ave., St. Louis 14, Mo., U. S. A.



Wagner Electric Corporation EST 1891

ELECTRIC MOTORS • TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

WTM-1

AIEE Winter Meeting Is Set for Jan. 21-25

Presentation of technical papers, inspection trips, and social activities are on the program for the Winter General Meeting of the American Institute of Electrical Engineers to be held Jan. 21-25 at the Hotel Statler, New York.

The general session, scheduled for Monday, Jan. 21, will include an address made by F. O. MacMillan, president of AIEE. The Edison Medal will be presented to C. F. Wagner, Westinghouse Electric Corp. Other institute prizes also will be awarded. Charles E. Wilson, director of the Office of Defense Mobilization, will make an address if his Washington duties permit.

A program of inspection trips of technical and general interest has been arranged. Included among the trips will be visits to Westinghouse Electric Corp, Hillsdale, N. J.; Sewaren Generating Station, Sewaren, N. J.; Okonite Co, Passaic, N. J.; and Dow Corning Corp Exposition, Governor Clinton Hotel, New York.

The annual recognition dinner of Eta Kappa Nu, electrical engineering honor society, will be held Monday evening, Jan. 21. At this dinner, the Eta Kappa Nu Plaque designating the most outstanding young electrical engineer for 1951 will be awarded, and men receiving honorable mention cited.

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Coal Gasification Parley Slated for Jan. 28-30

First international conference on underground gasification of coal will be held at Birmingham, Ala., Jan. 28-30, sponsored jointly by Alabama Power Co and the United States Bureau of Mines.

A number of European scientists and American experts on underground gasification are expected to take part in the conference. Experiments in gasification now going on in the U. S., Belgium, the United Kingdom, France, French Morocco, and Italy will be described. Technologists from several countries will present papers or contribute to technical discussions.

Technical meetings will be held at Birmingham and on-the-site inspections of a gasification project in operation will be made at Gorgas, where Alabama Power and the Bureau of Mines are now conducting their third cooperative experiment.

Co-chairman for the meeting will be Dr. M. H. Fies, manager of coal operations for Alabama Power, and Dr. W. C. Schroeder, assistant director of the Bureau of Mines.

8th Wiring Conference to Be Held Jan. 24-25

The eighth annual National Adequate Wiring Conference will be held Jan. 24-25 at the Sherman Hotel, Chicago. The conference is sponsored by the National Adequate Wiring Bureau, New York.

Lyle N. Foster, a member of the Plan Committee of the bureau, will serve as general chairman.

The two-day program will include discussions on the following:

1. Possibilities and problems connected with the use of aluminum for house wiring.
2. House wiring under the Controlled Materials Plan.
3. Certified adequate wiring program, Texas style.
4. Make money selling adequate wiring.
5. Adequate wiring promotion.
6. Simultaneous round table question-and-answer forums.

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Conference Renamed

The Midwest Power Conference, directed by Illinois Institute of Technology, Chicago, has been renamed the American Power Conference. Its first conference is set for March 26-28 in the Sherman Hotel, Chicago.

MEETINGS

Edison Electric Institute
Accident Prevention Committee, Hotel Roosevelt, New Orleans, La., January 7-8, 1952; Electrical Equipment Committee, Netherlands Plaza Hotel, Cincinnati, Ohio, February 11-12, 1952; Transmission-Distribution Committee, New Hotel Jefferson, St. Louis, February 14-15, 1952; 18th Annual Sales Conference, Edgewater Beach Hotel, Chicago, March 31-April 3, 1952; Purchasing-Stores Committee, Roosevelt Hotel, New Orleans, La., May 11-14, 1952.

American Institute of Electrical Engineers
Winter General Meeting, Hotel Statler, New York, January 21-25, 1952.

National Adequate Wiring Bureau
Annual Conference, Sherman Hotel, Chicago, January 24-25, 1952.

National Association of Purchasing Agents
Public Utility Buyers' Conference, Cleveland Hotel, Cleveland, Ohio, February 4-5, 1952.

Instrument Society of America
1952 Regional Power Plant Instrumentation Conference, New York Section, Hotel Statler, New York, February 7-8, 1952.

Missouri Valley Electric Association
Industrial-Commercial Sales Conference, Hotel President, Kansas City, Mo., February 7-8; Engineering Conference, Hotel President, Kansas City, Mo., April 2-4, 1952.

Pennsylvania Electric Association
Winter Meeting, Transmission-Distribution Committee, Penn Harris Hotel, Harrisburg, Pa., February 7-8, 1952; Hydraulic Power Committee, William Penn Hotel, Pittsburgh, Pa., February 7-8, 1952; Systems Operation Committee, Benjamin Franklin Hotel, Philadelphia, Pa., February 14-15, 1952; Winter Meeting, Relay Committee, Fort Stanwix Hotel, Johnstown, Pa., February 20-21, 1952; Prime Movers-Electrical Equipment Committees, Benjamin Franklin Hotel, Philadelphia, February 28-29, 1952.

Public Information Program
East North Central Region Meeting, Fort Wayne Hotel, Columbus, Ohio, February 19, 1952.

American Society for Testing Materials
Spring Meeting-Committee Week, Hotel Statler, Cleveland, Ohio, March 3-7, 1952.

National Electrical Manufacturers Association
Section Meeting, Edgewater Beach Hotel, Chicago, March 10-13, 1952; 4th International Lighting Exposition-Conference, Industrial-Commerical Lighting Equipment Section, Cleveland Auditorium, Cleveland, May 6-9, 1952.

Southeastern Electric Exchange
Engineering-Operation Section Conference, Jung Hotel, New Orleans, La., March 13-14, 1952; Annual Conference, Boca Raton Hotel, Boca Raton, Fla., April 21-23, 1952.

National Association of Corrosion Engineers
Annual Conference, Buccaneer Hotel, Galveston, Tex., March 10-14, 1952.

Illuminating Engineering Society
South Pacific Coast Regional Conference, Hotel Sir Frances Drake, San Francisco, March 13-14, 1952; Southwestern Regional Conference, Hotel Tulsa, Tulsa, Okla., April 6-8, 1952; Southern Regional Conference, Hermitage Hotel, Nashville, Tenn., April 20-22, 1952; Canadian National Conference, Hotel General Brock, Niagara Falls, Ontario, Can., April 30-May 2, 1952.

Pacific Coast Electrical Association
Operating Economics Section Conference, Hotel California, Fresno, Calif., March 20-21, 1952; Administrative Services Section Conference, Los Angeles, April 17-18, 1952; Business Development Section Conference, Hotel Huntington, Pasadena, Calif., April 24-25, 1952.

A&M College of Texas
Annual Conference for Protective Relay Engineers, Department of Electrical Engineering, College Station, Tex., March 24-26, 1952.

American Society of Mechanical Engineers
Spring Meeting, University of Washington, Seattle, March 24-26, 1952.

Illinois Institute of Technology
American Power Annual Conference, Sherman Hotel, Chicago, March 26-28, 1952.

Oklahoma Utilities Association
Annual Convention, Biltmore Hotel, Oklahoma City, March 27-28, 1952.

Maryland Utilities Association
Lord Baltimore Hotel, Baltimore, April 4, 1952.

Rocky Mountain Electrical League
Spring Conference, Shirley Savoy Hotel, Denver, Colo., April 20-22, 1952.

Public Utilities Advertising Association
Annual Convention, Hotel Radisson, Minneapolis, Minn., May 8-9, 1952.

International Organization of Standardization
Triennial Meeting, Columbia University, New York, June 9-21, 1952.

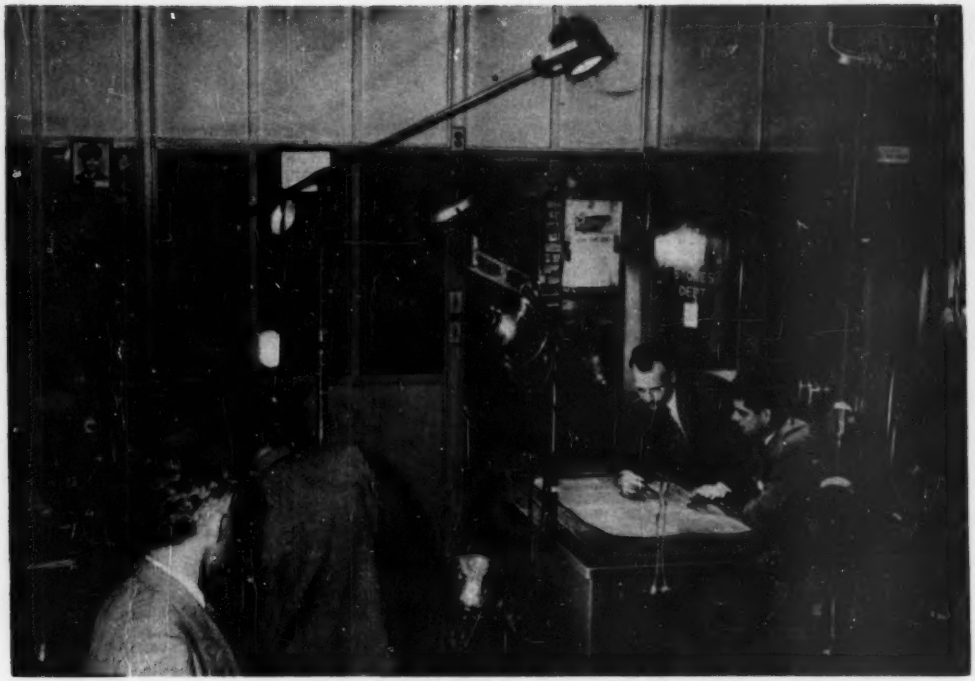
EMERGENCY job on a stormy night was simulated in Ashland, Ky., using company linemen, dummy pole, and water from fire truck

FAMILY of an appliance serviceman with Ohio Power was filmed in an off-to-school scene for the company-sponsored movie

In Our Part of the Country . . .

. . . is the name of the movie American Gas & Electric is making to help its member utilities develop good employee and community relations

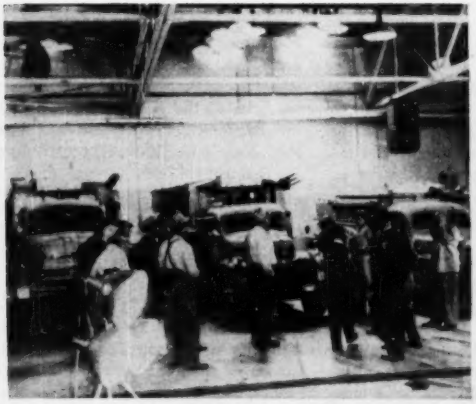
LOCAL COLOR shots from the Ohio Power Co area included this one of carrier boys receiving bundles of newspapers from a Canton Repository truck. Although bulk of motion picture will be identical in each service area's version, introductory scenes will be localized



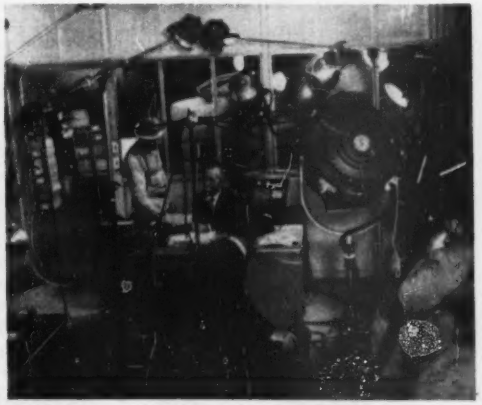
CLOSE-UP scene was shot in Stores Department of Kentucky and West Virginia Power Co's service building. Looking on at left foreground is G. S. Dunn, public relations director of Appalachian Electric Power Co. The picture will be released early this year

Early this year, American Gas & Electric Co will send out to its subsidiaries a full color film on the part the electric utility plays in the life of the community. The story line follows a typical day in a power company's operations. An introductory part will be localized to the service area of the six operating companies: Ohio Power, Appalachian Electric Power, Indiana & Michigan Electric, Kentucky and West Virginia Power, Kingsport Utilities, and Wheeling Electric.

Professionals will handle most of the acting, although power company employees will appear in a number of scenes. The 16 mm film will run 25 minutes, and will be shown to civic, school, and employee groups in the integrated service areas of the AG&E system.



CAMERA CAUGHT line-up of Kentucky and West Virginia Power trucks in the garage after the line gangs returned from their work



UNDER a battery of lights, Deb Lockwood of Kentucky & West Virginia interviewed a lineman as the cameras recorded the scene

Briefing Europeans on Power in New Jersey

FRENCH IS THE LANGUAGE used as engineers of Public Service Electric & Gas Co brief French utility men on company practices. The visitors addressed their questions to male interpreter (coat open and wearing bow tie). He gave English version to the New Jersey utility's men standing in rear. They gave their answers to female interpreter who relayed them in French by phone to the group. Answering the questions were John A. Inwright, standing left, superintendent of Sewaren Station; Philip H. Hartung, assistant general superintendent of generation; and Earl C. McMahon, seated, chief engineer of Sewaren Station. The French group, here under the sponsorship of the Economic Cooperation Administration, consists of management personnel from the French nationalized power system and from two private companies in France's North American colonies. The group of ten spent a month in this country. They visited Public Service and a number of other electric utility companies, federal power suppliers, and labor organizations before making the return trip to France

Pacific P&L Head Hails Power Pact with BPA

Signing of a five-year contract by five Pacific Northwest utility companies with the Bonneville Power Administration (EW, Nov. 12, p 4) assures the 700,000 customers of the privately owned utilities of the area a fair share of the additional power to become available from McNary Dam and other federal power projects under construction, according to Paul B. McKee, president of Pacific Power & Light Co, one of the companies signing the new agreement.

At the same time, he pointed out that until more generating capacity is developed, the amount of power from the Bonneville system available to the private companies will be limited and will vary with water conditions. The amount available, however, will be "firmed up" as more year-round power is produced.

"The agreement is a great step forward in the development of a fair and businesslike working arrangement between the government and the electric companies of the region," President McKee said.

"It puts us in a definite position with respect to our contract relationship with the government and eliminates many of the uncertainties that have tended to make it unnecessarily difficult to obtain private development capital for this fast-growing section of the country.

"I feel that continued progress can and should be made toward closer and more effective teamwork between federal and local power enterprises. There is a tremendous job to be done before we have all the power we can use in the Pacific Northwest, and we must help each other if we expect to get the earliest answer to the region's power needs."

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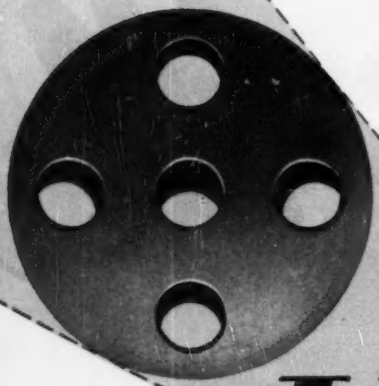
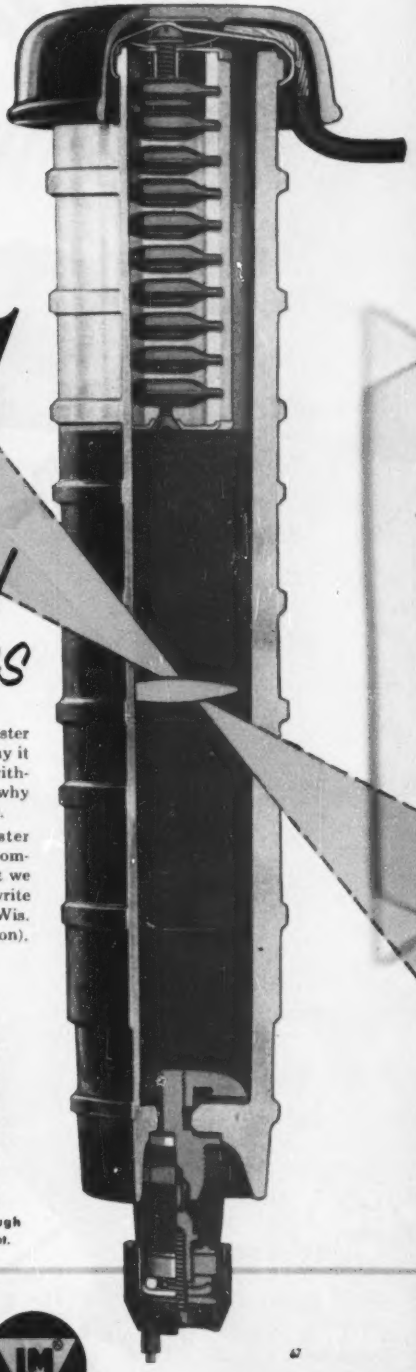
Council Votes Franchise

Miami Beach (Fla.) City Council recently voted 6 to 0 to grant a 30-year franchise to Florida Power & Light Co rather than establish a municipal electric system. The ordinance, to become effective, must win approval of the voters in a referendum.



the only lightning arrester with the LENS that gives it such high discharge capacity and unchanging characteristics



An ingeniously designed lens electrode is placed in the valve element of *every* L-M valve type arrester. This exclusive L-M feature performs an extremely valuable function that accounts for the exceptional performance and long life of L-M arresters.

Here's why. Lightning surge current tends to "skin" down the outside of the valve element, just as 60-cycle current will flow on the skin of a conductor. This results in only a small portion of the valve element being used to handle lightning surges. Thus the surge capacity of what might be a good arrester is materially lowered—the valve element will fail in time due to the excessive concentration of current on the outer skin.

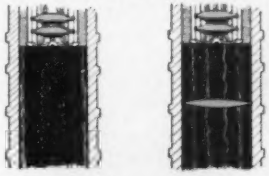
The L-M lens electrode completely counteracts lightning surge current "skin effect." The full cross-section of the valve element is available for extremely high surges—considerably in excess of 65,000 amperes.

The lens does the job. It distributes the surge evenly throughout the valve element—doesn't allow it to concentrate in any one path and thus clinker the element.

That's one reason why an L-M arrester can take more and heavier surges—why it maintains its high discharge capacity without change, for years and years . . . why its rate of failure is so gratifyingly low.

Get the whole story on L-M arrester performance, including some utility company records which substantiate what we say. Ask the L-M Field Engineer, or write Line Material Co., Milwaukee 1, Wis. (A McGraw Electric Company Division).

Here's What Happens

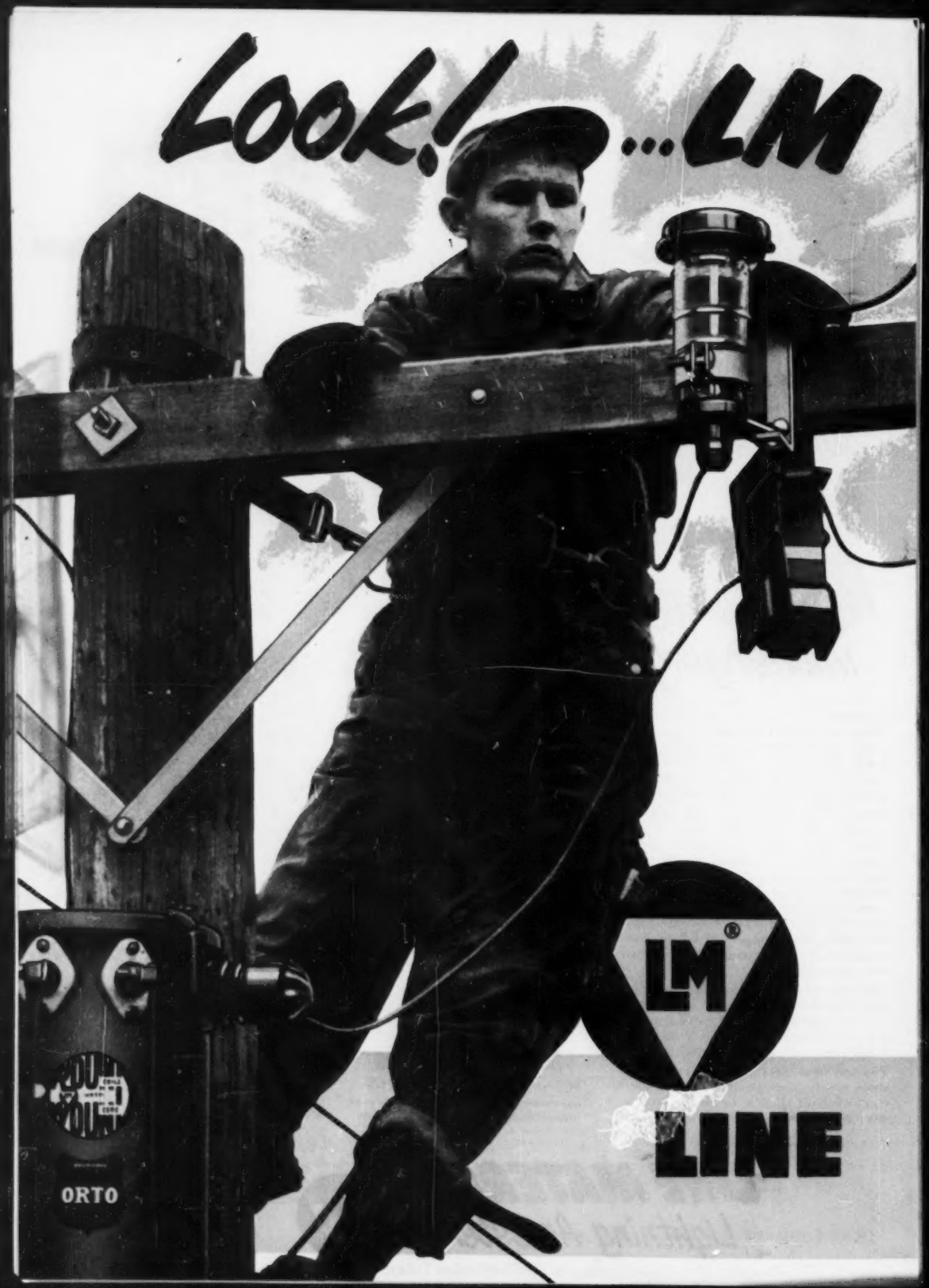


Without LENS
Surge channels down sides of element.

With LENS
Surge goes through the entire element.

LINE MATERIAL
Lightning Arresters

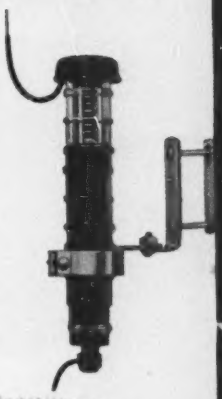
Complete Coordinated Equipment for Distribution Today


LOOK!...LM
LM®
LINE
ORTO

gives you the easy way to test lightning arresters

When lightning arresters are removed from service, it's important that they be tested, so that no faulty arresters are re-used. But it's *particularly* important on a delta-to-wye conversion program.

On a delta system, an arrester may be faulty, with no serious operational disadvantages. But on a grounded wye system, this same arrester can cause no end of grief—radio noise, line lockouts, and so on! So—it's necessary to be certain that any arrester removed from delta service be thoroughly checked before it is re-used on a wye system.



Electrical testing is one way

Generally speaking, the individual tests required on each arrester are these:

1. **60 cycle sparkover test**
2. **Leakage current test**
3. **60 cycle follow current test**

Testing equipment required varies from an induction regulator and high voltage transformer plus accessories for test No. 1, to a surge generator for test No. 3. Such equipment is expensive, and laboratory tests take considerable time of skilled men.

Visual testing...the L-M way

You are fortunate if you have L-M's Type E arresters in Pyrex® glass housings. Absolutely no electrical testing is required to determine their condition. *Visual* inspection is the complete test! Should the spark gap be damaged by any cause, permanent telltale evidence can readily be observed by a *Look* through the glass housing. If the valve element is defective, the Isolator will be blown! Just a *Look* tells the whole story. You can confidently re-use L-M glass-housed arresters after only visual inspection.

Get These Bulletins on Arresters and Testing. For complete information on L-M lightning arresters in Pyrex glass housings, ask the L-M Field Engineer for Bulletin LA-2. And there's a reprint of an L-M engineer's article on "Testing of Distribution Lightning Arresters"—with details, test circuits—Sheet 49087. Ask for that, too, if you're interested. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

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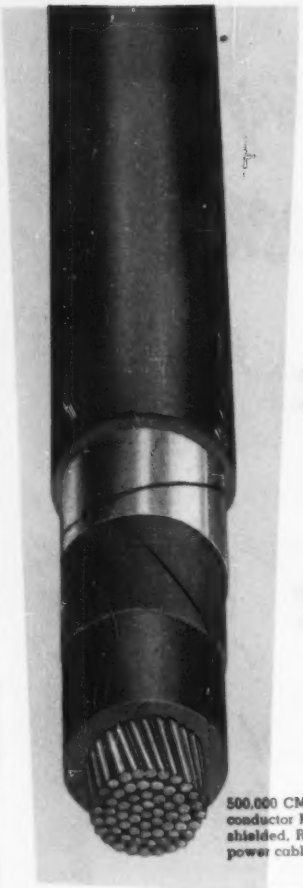
MATERIAL Lightning Arresters

Complete Coordinated Equipment for Distribution Today



500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed power cable . . . 15,000 volts.

Rome RoZone®

This Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE

Q: WHAT IS ROZONE?

A: A PREMIUM quality, ozone-resistant, oil-base type insulation developed by Rome Cable research, exceeding *all* requirements of ASTM specification D-574. RoZone is exceptionally resistant to corona action and aging. It shows high electrical stability in water and possesses excellent electrical characteristics. While the preferred outer covering is a RoPrene (Neoprene) sheath, RoZone insulation can be supplied with either braided or lead sheath coverings. In addition, on shielded types of cable, a special thermoplastic sheath is available.

Q: WHERE IS ROZONE USED?

A: Rozone is recommended for all specialized or general purpose wiring where long-time dependability is paramount. It is particularly suitable for higher voltages up to 15 KV. With proper sheath protection, RoZone is widely used for high voltage underground and aerial power distribution, street lighting circuits, signal and control cables, as well as for low-voltage power requirements where conditions of moisture or heat are present.

Q: WHAT DO ROZONE TESTS SHOW?

A:
1. High resistance to aging. Longivity of original characteristics.
2. On the basis of long-time test, dielectric strength exceeding 400 volts per mil, for 5,000 volt services. Surge or impulse strength proportionately high.
3. Utmost resistance to corona and ozone cutting.
4. Low dielectric loss.
5. Exceptional electrical stability in water.

The Rome Power and Control Cable Catalog contains complete information on Rome RoZone. Send for your copy today!

It Costs Less To Buy the Best

RoZone is approved and accepted by leading utilities, industrials and consulting engineers.

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ROME CABLE ROME, N.Y.

R. T. Kaighin Heads Interstate Power Club

Ralph T. Kaighin, supervisor of industrial power sales in the Newark, N. J., district of Public Service Electric & Gas Co, is the new chairman of

R. T. KAIGHIN

the Interstate Power Club. He succeeds Frank R. Auchy, Philadelphia Electric Co.

Other officers elected by the club are E. B. Haskell, United Illuminating Co, vice chairman, and Harry Doyle, Public Service Electric & Gas, secretary-treasurer.

Kaighin served Cleveland Electric Illuminating Co as power sales engineer from 1912 to 1923, except for seventeen months' service in World War I. In 1923 he joined Public Service E&G at Newark as an industrial power sales engineer. He became supervisor of industrial power sales at Newark in 1940.

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John D. Fitch has joined Ebasco Services, Inc, New York, as a consulting engineering specialist on economic analyses, investigations, and engineering problems in connection with financing. For the past nine years he has been principal engineer and chief of the engineering division of the Export Import Bank, Washington, D. C. From 1934 to 1942 Fitch served as an engineer with the Federal Power Commission.

Louis F. Dabe has been appointed director of the newly created Rates and Valuation Department of Columbus & Southern Ohio Electric Co. He joined the company in 1946 after his discharge from the Army where he was a lieutenant colonel in the Engineering Corps. From 1921 to 1939 he was on the engineering staff of the Ohio Public Utilities Commission, serving the last seven years as chief engineer.

J. Kent Burton has been named manager of manufacturing for the Electronic Tube Division of Westinghouse Electric Corp. Prior to joining Westinghouse early in 1951, Burton served 16 years with Radio Corp of America in cathode ray tube development and production.

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Consumers Power Co Elects Karn President

(*See Front Cover*)

Dan E. Karn, first vice president of Consumers Power Co since 1950, has been elected president of the utility. He succeeds Justin R. Whiting, who has been elected to the newly created position of chairman of the board and chief executive officer.

Karn entered the utility field in 1915 when he became associated with Central Illinois Light Co, Peoria. In 1916 he joined Consumers Power as superintendent of steam heating at the Grand Rapids division. Three years later he was transferred to the rate department of Consumers' general offices at Jackson and in 1921 was named assistant to the general manager. He became division manager at Kalamazoo in 1927 and assistant general manager at Jackson four years later.

In 1933 Karn was elected vice president and general manager of the company and held this post until he was named first vice president in 1950. He has been a director since 1933.

Whiting, president of Consumers Power since 1941, practiced law in Michigan until 1933 when he came to New York as counsel for Commonwealth & Southern Corp. He became president of the company in 1940, succeeding the late Wendell Willkie. The Commonwealth & Southern was dissolved in 1949.

Weston Makes Lamb VP of Manufacturing

Anthony H. Lamb, specialist in the photoelectric field, has been named vice president in charge of manufacturing of Weston Electrical Instru-

A. H. LAMB

ment Corp, Newark, N. J. He has been vice president in charge of the company's Tagliabue Instruments Division since 1950.

Lamb started with Weston in 1924 as an instrument assembler and ten years later was made senior engineer and head of the relay and control division. In 1941 Lamb was assigned to development of special instruments for the armed forces and at the end of the war received a Personal Achievement Award from the Navy for his work.

When Weston bought out Tagliabue Corp in 1948, Lamb was named assistant chief engineer of the Weston organization and acting chief engineer of the affiliate.

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H. H. Hanft has been appointed assistant to the manager of the industrial department of Westinghouse Electric Corp. He formerly was section manager of the transportation sales department. He joined the company in 1925.

Charles R. Martin has been appointed in charge of manufacturing, production, planning and production control at Hawley Works of Allis-Chalmers Manufacturing Co. He was assistant chief inspector of the company's gen-

eral machinery division for the last three years. **Henry F. Banzhaf** has been appointed asssistant to the manager of Hawley Works after serving since 1950 as special assistant to the manager of the control section.

Howard G. Lasselle, superintendent of distribution for Narragansett Electric Co, Providence, R. I., since 1948, has been appointed executive assistant to A. V. Coleman, assistant to the president of New England Electric System. Lasselle joined Narragansett in 1930 and became meter superintendent three years later. Previously he worked for New England Power Co and Fall Mountain Electric Co.

James Wilson has been named chief engineer of Painesville, Ohio, municipal electric plant, succeeding **Ralph L. Warner.** Wilson has served as assistant chief engineer.

Kenneth Smouse has been elected president and **W. D. Hardie** vice president of Columbia Basin Electric Cooperative.

N. H. Welch has been named superintendent of Kansas City Power & Light Co's system operating department, succeeding **G. H. English,** who retired Jan. 1. Welch has been with the company since 1922, and has served as chief load dispatcher since 1949.

M. J. Hale, office manager of Southwestern Gas & Electric Co's Marshall office since 1948, has been promoted to local manager at Marthasville, La. He has been with the company 24 years.

Ora S. Anderson has retired after 45 years service as a utility engineer, most of which he spent with Mississippi Power & Light Co.

W. J. Alcklen, vice president of Houston Lighting & Power Co, will resume his duties as head of the Galveston Division Jan. 1. He has served two years with the Houston Division on a temporary basis.

Owens E. Sadler, distribution superintendent with Arkansas Power & Light Co at Camden, Ark., has been promoted to local manager of the company's office at Wilson, Ark.

Central Maine Power Advances Ford Harris

Ford W. Harris has been appointed chief engineer of the Central Maine Power Co, Augusta, an affiliate of New England Public Service Co. In addition, he will continue to serve as agent and engineer of the Union

F. W. HARRIS

Water-Power Co and Androscoggin Reservoir Co, Lewiston, Maine.

Harris will supervise the design and construction of the company's major projects starting with Central Maine's new 75,000-kw Indian Pond hydro plant located on the upper Kennebec River.

He started with Central Maine Power in 1924 during the construction of the Gulf Island hydro plant. He has been identified with hydroelectric developments in northern New York State and with similar work for the affiliates of New England Public Service in Maine, New Hampshire, and Vermont. Lately he has been connected with the 60,000-kw addition to Central Maine Power's Mason steam plant, Wiscasset, and the Flagstaff Lake storage basin located on the Dead River.

•

John J. Doyle has been appointed manager of power tube sales for the Electronic Tube Division of Westinghouse Electric Corp. He has served 25 years with the company.

Lawrence P. Pleasants has been appointed merchandizing manager, lamps, of the Lighting Division of Sylvania Electric Products, Inc. Pleasants joined Sylvania in 1943.

Edward L. Taylor has been appointed manager of the Lamp and Lighting Sales Division of International General Electric Co.

•

A. G. Nelsen Is Elected VP of Lighting Group

A. G. Nelsen, Chicago district manager of the Lamp Division of Westinghouse Electric Corp, has been elected vice president of Chicago Lighting Institute. E. J. Doyle, Jr, assistant sales manager, Commonwealth Edison Co, was elected secretary-treasurer.

Gilbert K. Hardacre, manager of commercial sales, Public Service Co of Northern Illinois, has been re-elected president of the institute and C. W. Zersen, managing director, Chicago Lighting Institute, was re-elected assistant secretary treasurer.

Hardacre has been identified with the lighting industry since 1926. He became president of the institute two years ago.

The Chicago Lighting Institute is sponsored by the leaders of the local lighting industry for the purpose of providing a central location where light users may see and receive lighting information through lecture demonstrations, exhibits, conferences, and schools on what is new in lighting.

•

Mississippi PSC Elects

Two new members and a holdover from this year's commission will make up Mississippi's Public Service Commission beginning Jan. 21, 1952. The new members are Alton Massey and Ike Sanford. H. H. Little was re-elected to the commission. Massey and Sanford succeed Chairman H. H. Casteel and Commissioner C. M. Morgan.

OBITUARY

Robert Scott Pruyn, retired treasurer of Westchester Lighting Co, died Dec. 16 at Yonkers, N. Y. He served the company from 1900 to 1945.

L. F. Spruce, 64, general manager of Floresville Electric Light & Power Co, died in Floresville, Tex., Nov. 29. He had been general manager 30 years.

Sangamo J Meters

performance-proved by 12 years of service

In the consumer's mind the meter is the instrument which represents his dealings with the power company. In the interest of good public relations, the meter must instill confidence by its accurate performance . . . it must operate quietly and without trouble . . . and be thoroughly dependable.

Millions of Sangamo J Meters, many in use since 1940, give conclusive proof that they stay accurate. An eight year test record, by one large company, shows a change in average accuracy of only 0.03%. Such sustained accuracy is due in part to the modern noiseless, oilless, non-corrosive bearing system and the rigid dovetailing of elements in J Meters.

Troublefree operation is inherent in their construction. Built for outdoor installation, they are corrosion-resistant and are fully temperature compensated.

Only Measured Facts are Known Facts

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

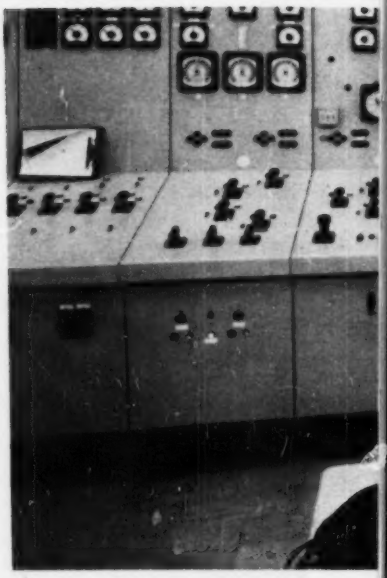
SM 59-1

Sangamo J Meters have proved their ability to meet today's requirements and tomorrow's anticipated loads with sustained accuracy, economy of maintenance and troublefree performance.

New System Control

Allocates Changing Load Among 29 Generating Units

W. J. CAMPBELL, Engineer, Electrical Engineering Division
Engineering Department, The Detroit Edison Company



CONTROL PANELS at Trenton Channel as seen from the operator's desk. Plant total

The Detroit Edison Company has installed and is now operating automatic load-frequency control equipment on its system that brings all 29 generating units at the company's four steam power plants under simultaneous control.

This control scheme, although in principle basically like that in use elsewhere, has a number of novel features. In addition to the usual function of maintaining constant frequency and constant scheduled tie line loading, the scheme has these added objectives:

1. To make all generation changes automatically and with a minimum of manual adjustments.

2. To make load changes at low, medium or high rates of response according to system requirements at the time.

3. To automatically make load changes on the plants in sequence (one at a time) or simultaneously (all plants together) according to the requirement.

4. To proportion load changes among the plants in a preset ratio that may be changed from time to time according to the system loading requirements.

5. To improve thermal efficiency of both boilers and turbines by spreading load changes over all four generating plants and among a total of 29 generators.

6. To improve economy of generation by automatically routing load changes to plants and to machines within the plants in preset proportions to give best generating economy for the plant loadings and units in service at the time the load changes.

This automatic load-frequency control has been in service on the Detroit Edison system since early this year. The results have been quite satisfactory. Not only have frequency and tie line loading been much better controlled but there has been a smoothing out of loads on generating units and of pressures on boiler plants. Tie line loading will be still further improved when the other systems interconnected with Detroit Edison have installed similar automatic control.

The Detroit Edison Company's four steam power plants are spaced over a distance of 70 miles and linked by a 120-kv overhead and underground transmission system. There are two 100-Mw interconnections with Consumers Power Company to the west, and local ties with plants of the Ford Motor Company and the Detroit Public Lighting Commission. The Company's present plants have a nameplate capacity of 515,500,385, and 300 Mw respectively, and contain a total of 29 main turbine-generator units.

Plans are laid for extending automatic load-frequency control to Detroit Edison's new St. Clair Power Plant. When the present 3-unit project is completed the Company will have 32 units under simultaneous control.

Required by Load Growth . . . Until within recent years, the system was able to operate quite satisfactorily on manual frequency control. One plant having the most flexibility at the time, was designated to take swings necessary for frequency correction and the remaining three plants were operated at loads assigned to them by the system load dispatcher. As large changes in load assignments were being made by a plant, frequency regulation was temporarily delegated to that plant while it was making the change.

After World War II however, this favorable condition changed rapidly. The reserve in system generation was taken up by the rapid growth in load. It became more necessary for Detroit Edison and Consumers Power to pool their reserves and maintain scheduled interchanges of power. Some of the new load was of steel plant character, causing large irregular and random swings in frequency and it became increasingly difficult for the frequency regulating plant to manually perform its function. Then, too, the irregular swings in load were superimposed on the scheduled loadings of the interconnections. To assign two or more plants to manual frequency regulation was found to be unsatisfactory and resulted in the equivalent of hunting between the plants. It appeared then that the installation of automatic load-frequency control was warranted.

In the Fall of 1948 a committee was formed within the company to study the problem. Working in cooperation

generation recorder is at right on vertical board. In front on bench section are nine load-frequency control switches; one per unit plus a "Trip and Reset" switch. To left of recorder is frequency meter. Console, foreground, has knob-operated load setting dials

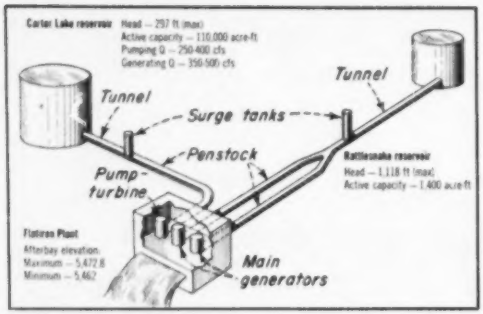
with the Leeds and Northrup Company the automatic load-frequency control scheme was decided upon.

With the installation of the equipment, associated with load-frequency control, load totalizing within the plants and on the system was improved by the replacement of older instruments with modern ones and an older system of telemetering was replaced by a modern, fast, accurate and reliable system of telemetering of the impulse duration type. Raise or lower control impulses on a plant are relayed to the boiler room to flash red or green lamps. By the frequency of occurrence and duration of these flashes the boiler operators are better equipped to anticipate the trend of load changes on the boilers.

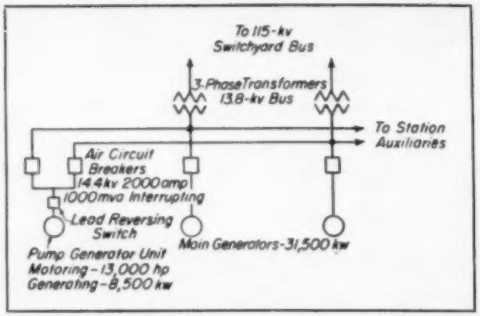
Safeguards . . . Safeguards have been provided in the scheme to protect against abnormal or faulty operation. Alarms notify the load dispatcher when preset limits in the control have been exceeded. The control is automatically restored to manual on telemetering failure, on failure of ac supply, if impulses are of a longer duration than normal or if any abnormality occurs to cause the frequency to vary more than plus or minus 0.5 cycles from normal. Telemetering and transmission of control is wholly over Detroit Edison's privately owned telephone circuits. For the most part these telephone circuits are underground where they are isolated and appropriately marked. One circuit in particular is backed up by two-way beamed microwave.

Present Unit Loads . . . Controls at the four plants are similar. The control at Trenton Channel Power Plant has been selected as a typical example. The accompanying picture is a view of the generator control panels as seen from the plant operator's desk. To the right of the photograph is a plant total generation recorder, and on the bench section in front of it are nine load-frequency control switches. One of these nine switches is the "Trip and Reset Switch" and is used to put the plant in or out of automatic control or to automatically trip it off. The remaining eight switches (one for each generating unit in the plant) are used to put the units in or out of control. The frequency meter to the left of the recorder takes no part in automatic frequency control except to trip the "Trip and Reset Switch" if frequency deviates more than plus or minus 0.5 cycles from normal.

On the operator's desk is a console having knob operated load setting dials, one for each generator. The plant operator, from the total generation recorder and from the generator panel instruments, has knowledge of the plant loading and the loads of the generators. He adjusts the load setting dials to give the desired proportioning of loading. "Raise" and "Lower" impulses incoming to the plant are routed from one unit to another in sequence and bring the units to the adjusted proportioning. The sequence continues to be repeated and as the plant load is raised or lowered the units hold the same proportioning until a new setting is made on the load setters. Any number of units can be on automatic control so that the unit to be flat loaded is left on manual. If a plant load is rising and a unit has been synchronized and warmed up, the controls can be used to bring it up to desired load; likewise, if plant load is lowering, the controls can be used to unload a unit preparatory to shutdown. It is possible, therefore, for a plant to go through a daily load cycle without load adjustments on the generators other than those made on the load setting dials.



HYDRAULIC PROFILE of the Flatiron installation. The pump-turbine unit operates with full open valve, has no governor


To 115-kv Switchyard Bus
3-Phase Transformers 13.8-kv Bus
To Station Auxiliaries
Air Circuit Breakers 14.4 kv 2000 amp 1000 mva Interrupting
Lead Reversing Switch
Pump Generator Unit Motoring – 13,000 hp Generating – 8,500 kw
Main Generators – 31,500 kw

ELECTRICAL CONNECTIONS permit starting of pump-turbine from the system or from either conventional-type generator

Flatiron Plant To Use Pumped Storage

JAMES E. NEWCOMER
Electrical Engineer
Bureau of Reclamation
Denver, Colo.

Pumped storage of water for production of power will be the unusual feature of the Flatiron Power and Pumping Plant, now under construction by the Bureau of Reclamation in northeastern Colorado. This plant is believed to be one of the first major installations in the United States in which the same unit will be used for both pumping and for generating hydroelectric energy. It will house two conventional waterwheel generators and one reversible pump-generator.

The new plant is part of the Estes Park-Foothills Power Aqueduct of the Colorado-Big Thompson Project, which diverts water from the headwaters of the Colorado River through the Continental Divide to supplement the water supply for irrigable lands in northeastern Colorado. Hydroelectric power for the project is also developed from the head created by the diversion of water from the western slope to the eastern slope of the Divide.

Seasonal Function . . . Primary purpose of the power-pumping unit is to provide for a seasonal cycle of pumping during the winter season and generation of power during the summer irrigation season. It can also be used for true pumped storage operation by following a daily cycle of pumping during low system loads and generating during system peaks, if the value of peaking power is sufficiently greater than that of secondary power to justify absorption of combined losses.

The power-pump unit will operate to pump water or generate power as required. It will pump water from the afterbay of the Flatiron Plant into Carter Lake Reservoir. Water stored in this reservoir can be released either directly into a canal for irrigation purposes or back through the unit for generation and ultimate irrigation.

The pump-turbine will be the vertical shaft, single-impeller, centrifugal type with fixed-vane diffuser-type spiral casing. Total heads will range from 170 to 297 ft for pumping, from 140 to 290 ft for generation. Designed to operate at 300 rpm, the pump-turbine will deliver 370 cfs under a total head of 240 ft. With no provision made for wicket gates or governor, it will be operated as a turbine with full open valve. For pump operation the unit will start with the pump casing full of water and discharge valve closed. For starting as a turbine, the butterfly valve, located in the discharge-penstock line, may be controlled manually to synchronize the unit with the system.

Switching Features . . . The reversible generator-motor, rated 13,000 hp for motor operation at unity power factor, will be the synchronous type operated at 13.8 kv. Rated output as a generator will be 8,500 kw at 0.85 power factor. The unit will have a direct-driven shunt-wound exciter. Switching is provided so that for motor operation it can be fed from either or both main generators or main transformers. For generator operation it can feed into the system through either or both transformers, either independently or in parallel with the main generators.

For motor operation the reversible unit will be started as an induction motor across-the-line at full voltage with automatic field application. Such starting normally can be used without causing objectionable voltage dips on the connected system. The unit can also be started by one of the main generators isolated from the system. After the motor and generator have been synchronized, they both can be synchronized with the system. Electrical starting will also be possible in the generator direction of rotation. Double-throw switch permits changing the main lead connections for either generator or motor operation.

Each of the two conventional generators will be driven by a 48,000-hp Francis-type turbine at 514 rpm under heads ranging from 1,020 ft to 1,118 ft and will have a rated output of 31,500 kw at 0.9 power factor. Power from each of the main units will be generated at 13,800 v and fed through a 3-phase transformer to the 115-kv system. Each transformer will have a self-cooled rating of 35,000 kva, and a forced-air rating of 43,750 kva.

We Compare Electric and LP Cooking Costs for Dealers

M. R. NORTON
Wisconsin Power & Light Co
Madison, Wis.

We kept on hearing that high cost of operation and slow speed, compared with gas, are high on the list of obstacles to the sale of more electric ranges. So we put together a cooking cost demonstration and presented it to dealers, distributors' salesmen and our own merchandise salespeople in a round-robin of thirteen district meetings.

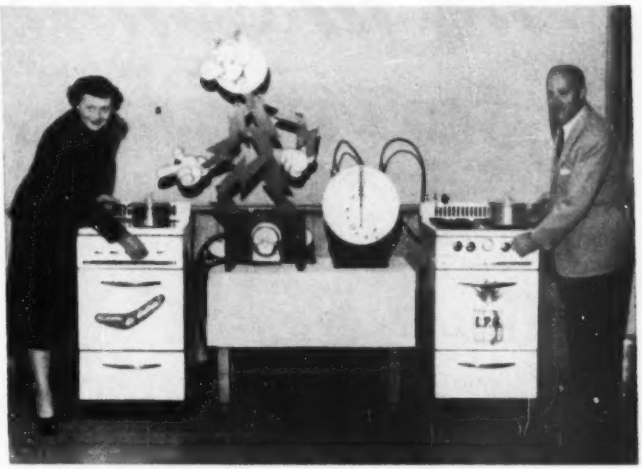
The idea was to cook identical quantities of several types of food in identical utensils at the same time on two similar ranges, one using electricity and the other bottled gas. We measured the electricity and gas with meters that registered in pennies so that all could see the comparative costs without resort to slide rule or conversion tables. Every effort was made to keep the demonstration completely fair and impartial without tricks of any kind. Even the dyed-in-the-wool bottled-gas dealers were unable to find any flaw.

We selected two apartment-size Monarch ranges built by the Malleable Iron Range Company, Beaver Dam, Wis., for ease of handling in and out of the trailer we used to carry the show.

Standard electric and gas meters were modified with scales to read in cents. The electric meter was fixed up to read at 2.3¢ per kwhr, which is the rate step on which cooking is mostly done on our system. The gas meter scale showed cost of gas at prices per lb ranging from 10¢ down to 5¢.

To convince dealers of the fairness and impartiality of the demonstration we had representatives of the state Public Service Commission double check both meters to make sure they were accurate.

The demonstration consisted of two parts, first baking, then surface cooking, and was conducted by Miss Loreen Jacobson, our home economics director. Batter for two plain white cakes was mixed backstage a few minutes beforehand, using a prepared cake mix, and equal portions poured into identical 8-inch aluminum cake pans. Then the ovens were started on pre-heat to 375 deg. As each oven came up to temperature, the cake was popped in and an accurate timer set. While the cakes were baking the dealers were told about our fall range campaign.



COOKING COSTS in cents are shown by meters between electric and LP ranges of same make and size used in cooking cost demonstration before Wisconsin dealers

The audience received its first surprise when the electric oven came up to temperature a minute or two before the gas range oven.

The second surprise came when they learned that in order to reach the same degree of brownness, the cake in the gas oven had to bake four minutes longer than in the electric (22 minutes compared with 18) even though the controls were set at the same temperature. (This, we explained, was due to the longer temperature over-run after the electric oven control shut off the current.)

The third surprise was the reasonable cost for electric baking. The cake in the electric oven took 1.75 cents to 1.8 cents worth of electricity, depending on the outside temperature and voltage. To bring the cake in the gas oven to the same degree of brown color took almost exactly 2 cu ft of gas. This means 1.78 cents worth of gas at 7½ cents per lb. We explained that for short baking operations like cakes, biscuits and cookies the cost of bottled gas compared more favorably than with any other cooking operation except broiling.

Miss Jacobson then placed exactly ½ cup of rice in each of two identical aluminum sauce pans and added exactly 1½ cups of water to each. One pan was placed on the standard unit of the electric range and the other on the standard burner of the gas range, the audience choosing which pan went on which range. The meters were turned back to zero and the ranges turned on simultaneously.

Again the audience was surprised when steam appeared first from be-

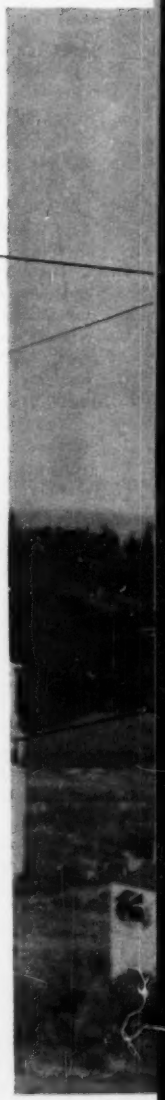
(*Continued on page* 39)

DON'T FORGET

Midnight, January 31, is Closing Time for Your Entry . . .

. . . In the Merit Award Competition of the 4th International Lighting Exposition. Mail entries to Merit Award Committee Room 818, 326 West Madison, Chicago 6.

Pole in splinters ...service intact!



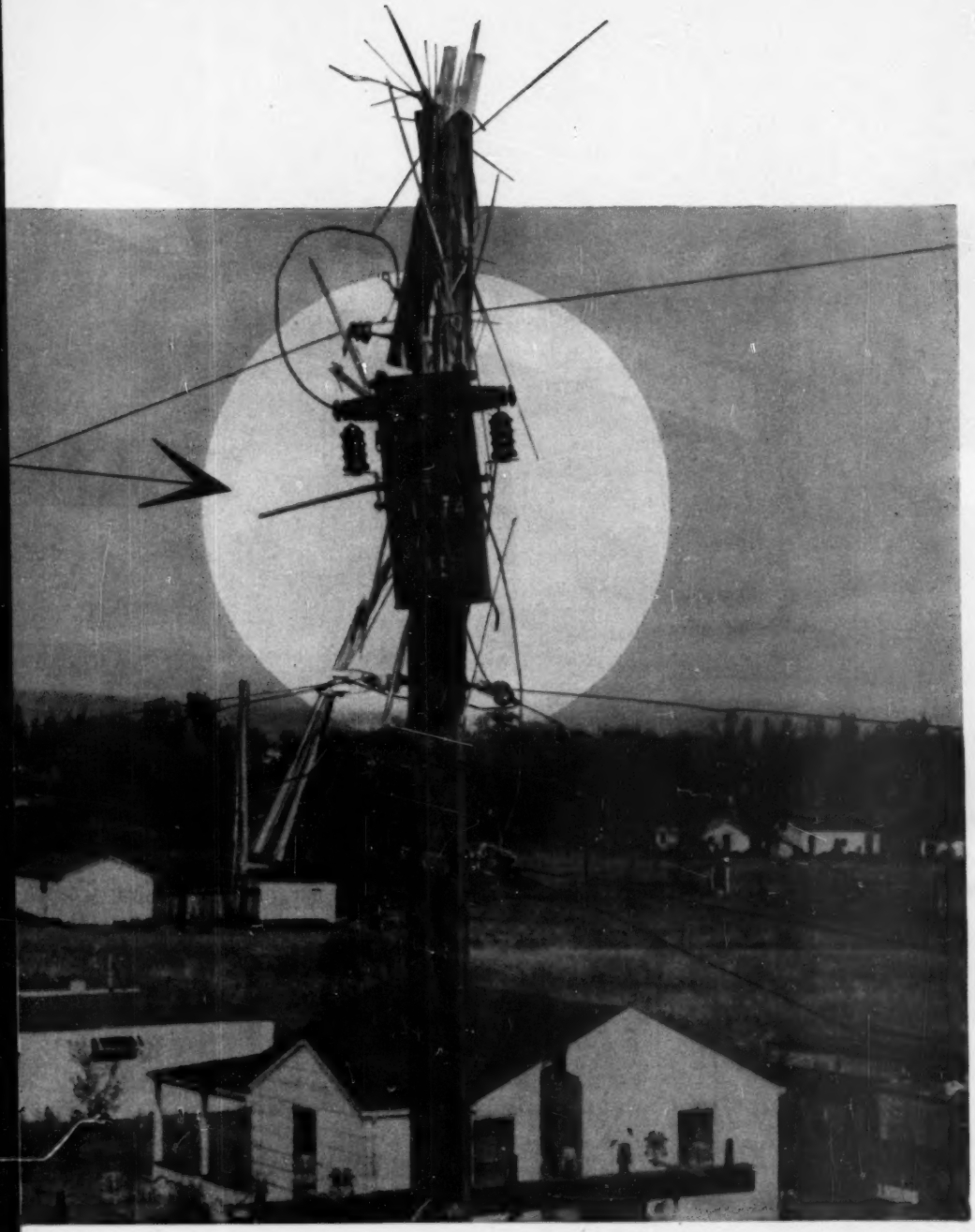
On Loretto Heights Hill, near Englewood, on the Colorado Central Power Company system, this Westinghouse "CSP®" Distribution Transformer took a direct stroke of lightning early in the evening, yet maintained service with no interruption throughout the night!

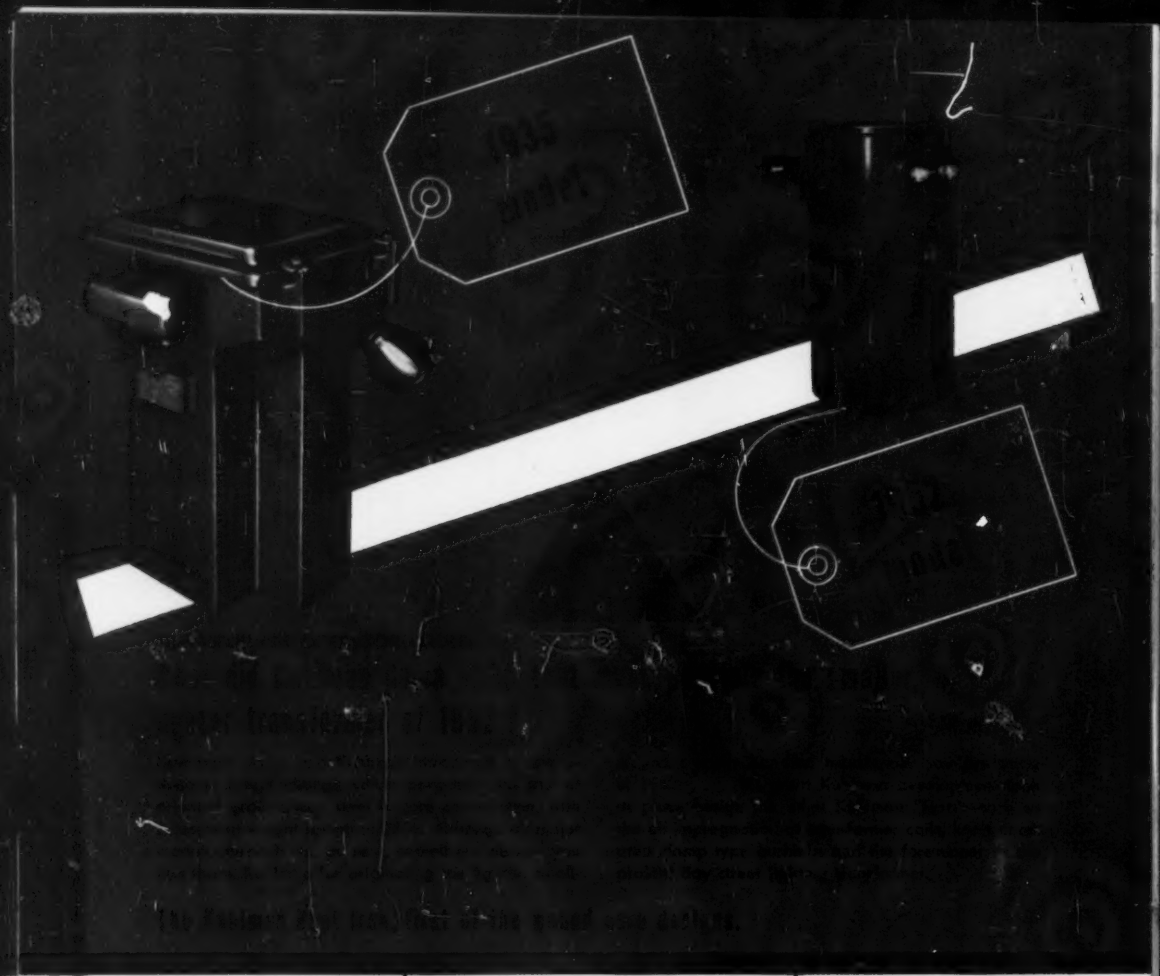
The following day, when a new pole was installed, the transformer was found to be completely unharmed, although the ground lead from the tank discharge gap was burned off. The unit was therefore again hooked up for service.

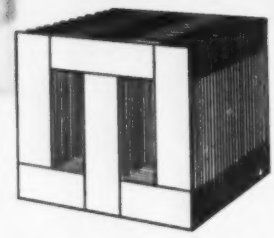
Westinghouse "CSP" (Completely Self-Protecting) Transformers, because *all* parts are factory co-ordinated, provide better protection against lightning, surges, short circuits, and overloads, giving assurance of service continuity. Your Westinghouse Representative will be glad to show you actual figures which explain why Westinghouse "CSP" Transformers offer bigger savings in installation and maintenance costs. Call him today. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70616

"CSP" devices . . . originated and patented by Westinghouse

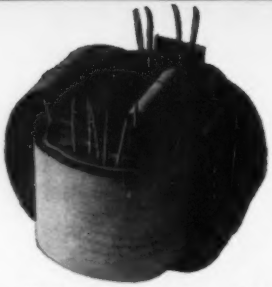
YOU CAN BE SURE... IF IT'S
Westinghouse
"CSP" DISTRIBUTION TRANSFORMERS



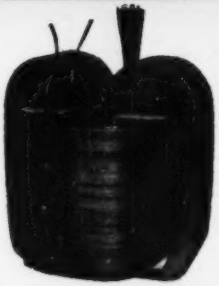




This is the old, pre-1935 butt end transformer core, which had several joints of appreciable flux densities and in which much of the magnetic material was fluxed against the grain.



The first step toward a better design, with the magnetic material fluxed parallel to the grain, therefore reducing both circuit reluctance and exciting current and greatly improving space factor.



First of the wound core designs—the great Kuhlman Bent Iron Core! Note it has only one joint in each branch of magnetic circuit, reducing reluctance; more efficiently utilizes materials in their most desirable characteristics, thereby making a smaller, lighter transformer.

K E

Comparing LP and Electric

(*Continued from page 35*)

neath the lid of the saucepan on the electric unit. The switch was turned to position 6 and a timer set to allow it to cook for 20 minutes.

The meter showed that 0.3¢ worth of electricity was used (at 2.3¢ per kwhr) to cook the rice. The gas meter showed the use of 0.46¢ at 7½¢ per lb or 0.32 cents at 5¢ per lb.

In other words, the demonstration showed that for surface cooking a customer will have to buy bottled gas for less than 5 cents a pound to equal electricity at 2.3 cents per kwhr.

The chief benefit of the demonstration appears to be that it gave salesmen, dealers and distributors' salesmen a more convincing story on the economy and speed of electric cooking. Many of them admitted that they had been told that it was true, but now, since they had seen the proof with their own eyes, they could face the argument of high cost and slowness with a more convincing sales story.

"IT PAYS" is the punch prase in West Penn Power Co's billboard advertising of adequate wiring

Billboards Sell Adequate Wiring

Y. L. RIPLEY
Manager, Electric Home Bureau
West Penn Power Co
Pittsburgh, Pa.

Red Seal certifications of adequate wiring in the sixteen-county, 8,775-square-mile service area of the West Penn Power Co have increased steadily since the war. In 1947, 177 certificates were issued to home owners and in 1948, 500. Certificates in 1949 totaled 699, up 60% from 1948; 1950's increase was 43%, for a total of 1,002. Preliminary estimates are that the 1951 figure, with fewer new homes connected, will exceed the 1,000 figure by a comfortable margin.

Contributing to these results are 52 strategically located 24-sheet billboards on principal highways approaching cities and towns in the company's service area, which has a population of about 1,110,000. New sheets posted each month promote the company's service by encouraging the purchase of electric ranges, electric water heaters, and good lighting.

In 1947, the list of subjects were expanded to include adequate home wiring, which appears on the boards twice a year. The billboard message is kept short, in order that motorists can read and digest the information in the three to five seconds it takes to pass a sign. That the message gets across is attested by the many calls to local company offices inquiring about Red Seal wiring.

The Outlook for Television In 1952

Television will become a greatly increasing part in American life in 1952, particularly in respect to the coming presidential campaign. Conversion of manufacturing facilities to defense production and shortages of critical materials will prevent output of receivers from expanding, perhaps will reduce it. Prices of receivers are firming up. And despite the possibility of short supply for the market, vigorous sales effort will be needed to move production into the hands of buyers. That's how television looks for 1952 in the eyes of industry leaders.

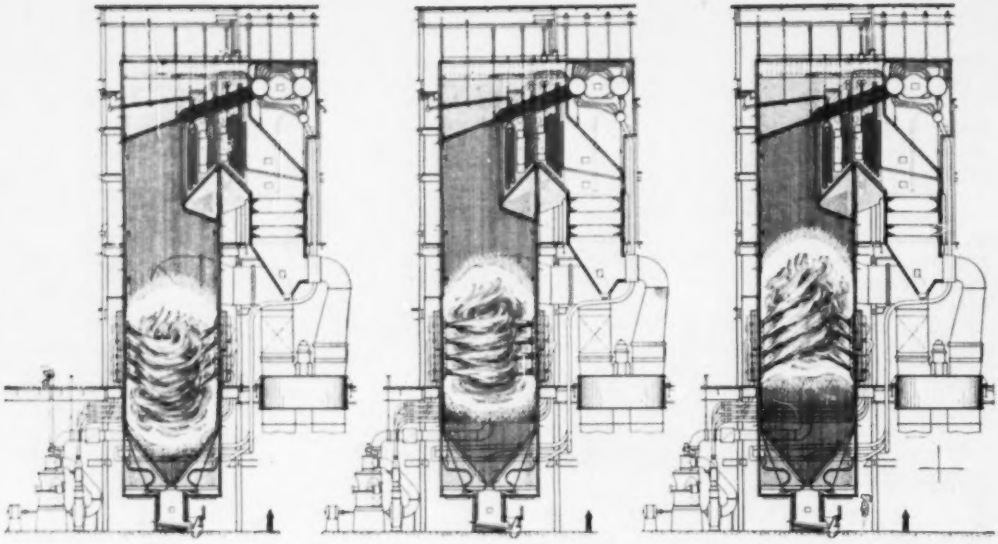
"By election day", says David Sarnoff, RCA, "there will be approximately 18 million television sets in the United States, with a potential audience of more than 60 million persons —exceeding the total population of the United States when Grover Cleveland campaigned in 1884.

The Du Mont organization already is in defense work with a military backlog of over $60 million. The company will be in high gear on defense production by early spring. It is anticipated that total sales, which were around $50 million in 1951, will reach a company high-water mark in 1952 between $100-125 million.

Admiral Corporation says that TV manufacturers have recovered from the severe sales slump in the first half of 1951 and industry production has leveled off at 400,000 units per month, which is approximately as many sets as can be made under present allocations of critical materials such as cobalt, nickel, copper and steel. About 5,000,000 TV sets were manufactured in 1951, compared with 7,500,000 in 1950. Production in 1952 should reach the 1951 figure, barring all-out war or further restrictions on our supplies of raw materials.

Emerson Radio and Phonograph Corp says about half of the industry's volume is expected to be in defense production which is expected to reach its peak in 1953. In the meantime, the industry will arrive at a much healthier situation than in the recent past.

Due to CMP allocations, Majestic Radio & Television, as well as the rest of the industry, will be forced further to curtail the production of TV receivers in 1952 according to Leonard Ashbach, president.



Advantages of the C-E Tilting Tangential Burner

The combination of tangential firing and the Tilting Burner accomplishes certain highly important results beyond the reach of any other burner or firing method presently available. These are:

1. Control of the temperature of furnace gases at the furnace exit which permits:
   - *(a) Control of steam temperatures over a wide range.*
   - *(b) Minimum use of desuperheating spray.*
   - *(c) Use of wide variety of coals.*
   - *(d) Accurate proportioning of superheater and reheater surfaces.*
   - *(e) Lower air heater maintenance.*
2. Substantial control over slagging conditions which results in:
   - *(a) More uniform furnace conditions.*
   - *(b) Better heat absorption.*
   - *(c) Minimum use of soot blowers.*

Recognition of the importance of these advantages throughout the utility industry is evidenced by the fact that more than 90 per cent of the C-E boiler capacity ordered by utilities in 1951 will be equipped with C-E Tilting Burners.

B-454

COMBUSTION ENGINEERING — SUPERHEATER, INC.

200 Madison Avenue • New York 16, N. Y.

ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS

Westinghouse Expects Cuts in Civilian Output

In the year of 1952, the nation's industry is faced with the steadily mounting demands of defense production and a corresponding drop in the output of consumer goods.

This trend, which became increasingly apparent in the last six months of 1951, was emphasized in the year-end statement made by Gwilym A. Price, president of Westinghouse Electric Corp.

Influencing Factors

Westinghouse's activities have been influenced by these factors. For example, in the latter part of 1951, orders for military equipment of all kinds began to rise in volume and restrictions on the use of critical materials were made tighter and tighter. At Westinghouse, more than 40% of all the company's unfilled orders at the end of last year were for direct defense needs.

Production of consumer products during the past year at Westinghouse was down only 10% from the record year of 1950, despite severe handicaps. The use of alternate materials, design changes that required use of less critical items, and reduction of scrap losses helped to achieve this result. Although Westinghouse anticipates deeper cutbacks on civilian goods output for the early part of 1952, the company expects the situation to improve by the fall of the coming year as supplies of materials such as copper, steel, and aluminum become more readily available.

Record Expansion

To meet defense requirements and to provide for continued growth of business in the coming years, Westinghouse during 1951 undertook the largest expansion program of its history. A total of $296 million will be spent for the construction of new plants, the enlargement of present facilities, and the installation of new and improved equipment. The new program will increase productive capacity by 50%. The company also took steps to integrate all of its defense activities by forming the Defense Products group.

The tremendous growth of the electrical industry has influenced Westinghouse's production. Right now, the quantity of power generation equipment under construction at Westinghouse is larger than at any other period in the company's history. Turbine-generators ranging up to 200,000-kw capacity—largest ever built—are now under construction.

Insulation Highlights Exposition

Properties and applications for Silicone (Class H) Insulation are illustrated in one section of the Dow Corning Silicone Exposition held recently in Detroit. The display also included solenoids, switches, electronic parts, motors, coils, and electric machines.

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Acquires Facilities

Joseph T. Ryerson & Son, Inc, Chicago, has acquired the stocks and warehouse facilities formerly owned by the Seattle Steel Co and Inland Empire Steel Co, Seattle and Spokane, Wash., which are in the process of dissolution. Both companies operated warehouse businesses in the Northwest territory and carried stocks of carbon, alloy and stainless steel, aluminum, copper, and brass. Clyde Summerville, president of Seattle Steel, and its Seattle sales manager, William Case, and Spokane manager, Ray M. Bialkowski, and the employees of both concerns will continue to serve the Ryerson firm.

Westinghouse and IUE Agree on Wage Boost

An agreement between Westinghouse Electric Corp and the International Union of Electrical Workers, CIO, has been reached on a wage increase ranging from 5 to 10¢ an hour. The wage increase, retroactive to Nov. 1, 1951, applies to 43,000 IUE employees.

The agreement also provides for a three-week vacation starting in 1952 for those employees with 15 years or more service. At present, a three weeks' vacation is given to employees who have 20 years of service or more. The increase and vacation benefits are both subject to the approval of the Wage Stabilization Board.

According to IUE, the latest pay increase will bring an average pay boost of approximately 6¢ to the majority of its workers. For salaried employees represented by the IUE, the increases range from $2 to $4 a week on the basis of a 40-hour week.

The wage increase is the second granted by Westinghouse in 1951 to

its IUE employees. It brings their total pay boosts for the year to about 15¢ per hour. Last June, the corporation granted a pay increase of 9¢ to its employees.

The company and the IUE have agreed that the subject of wages and salaries may be reopened at any time in the period between April 1, and April 30, 1952.

The independent United Electrical Workers is still negotiating with the company.

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Aluminum Expansion

Revere Copper & Brass, Inc. plans to extend aluminum fabricating operations to its Los Angeles plant. The firm will double the size of the plant to permit production of aluminum tube and extruded shapes in a variety of alloys, both heat-treated and non-heat-treated. The plant at present fabricates only copper and copper alloys. Operation of the new facilities is scheduled to start in the spring of 1953. The company also is expanding its aluminum operations at its Baltimore, Md., plant doubling facilities for drawing aluminum tube and extruded shapes.

MANUFACTURING BRIEFS

General Electric Co has made available to interested groups a 12-minute, black and white, sound slidefilm, "Productive Maintenance." The film presents a visual report on the main elements of the company's Productive Maintenance Program, including case histories and recommendations for maintenance.

Sprague Electric Co, North Adams, Mass., has opened an application engineering office at 3 East Second Street, Dayton, Ohio. William M. Lana, former Air Force engineering officer, will head the new office, which will provide more effective contact with Midwest government research and development laboratories.

Highway Trailer Co, Edgerton, Wis., has opened a direct sales and service factory branch at 2150 Colerain Avenue, Cincinnati, Ohio. It will be under the supervision of L. E. Craig, Jr, as manager. The new branch will include more than 16,000 sq ft of shop space in addition to the parts department, offices, and a storage lot.

Lincoln Electric Co, Cleveland, Ohio, has paid $4,121,426 to 1,082 employees for its 18th consecutive distribution of incentive pay in a year-end bonus. Each employee, with the exception of James F. Lincoln president, has received a check, averaging 104% of his regular earnings throughout the year. The incentive pay checks brought the average total earnings for a Lincoln worker in 1951 to $7,446.

Seattle City Light has awarded a $373,000 contract to the General Electric Co for furnishing two 115-kv transformers within the specified delivery time of 24 months. Although Ferranti Electric, Inc, an English firm, was low bidder at $266,000 on Nov. 27, it asked 40 months for delivery.

The Square D Co, Detroit, Mich., has purchased a half block of land in the industrial section of Seattle, Wash., as the site for a new plant. In 1952 the firm contemplates construction of a large plant, including factory and office facilities.

Production has been resumed at Westinghouse Electric Corp's Motor and Control Division at Buffalo, N. Y., after settlement of a 12-week strike of Local 1581, International Union of Electric Workers, CIO. The strike involved seniority rights.

Production of nickel in the free world for the full year of 1951 will approximate 295 million lb, an increase of more than 10% over 1950. Dr John F. Thompson, president of International Nickel Co of Canada, Ltd, predicts. Of this total it is estimated that Canada produced 275 million lb, or more than 90%. Canada produced 247 million lb of nickel in all forms in 1950.

Day-Brite Lighting, Inc, St. Louis, plans to build an 8,000-sq-ft addition to its plant. The new facilities will cost $100,000.

General Electric Co expects to be able to turn out 20 million "high-reliability" tubes a year by the end of 1953 for military electronics equipment. E. F. Peterson, manager of the company's tube sales, said that in order to meet this goal a specific list of tubes needed has to be established. He added that makers of high-reliability tubes must maintain continuous production runs to assure consistent quality.

SALES ASSIGNMENTS

COMPANY STAFFS

Pacific Electric Manufacturing Corp has named R. W. Hutchinson as eastern division manager at the Gary, Ind., plant, succeeding E. S. Kessler who died recently. Hutchinson was formerly manager of air switch sales at the San Francisco plant of the company.

General Electric Supply Corp has named O. B. Hubenthal manager of its Seattle district. Hubenthal, who joined the company at Spokane, Wash., in 1928, has been sales manager for supplies and apparatus in the district.

Hubbard & Co, Pittsburgh, has appointed LeRoy A. Ehmsen sales engineer in Des Moines, Iowa. His territory includes Iowa, eastern Nebraska, and a few counties in southeastern South Dakota and northwestern Illinois.

Fairbanks, Morse & Co, Chicago, has named Clifford J. Schroeer manager of its St. Louis branch. Schroeer, formerly manager of the diesel engine department, succeeds L. A. Weom.

General Electric Co has appointed E. G. Staley Maxwell manager of its Charleston, W. Va., apparatus sales office. Maxwell succeeds James J. Fitzgibbon who now is manager of the apparatus sales office in Washington, D. C. John H. Pharis, Jr, has been named to Maxwell's former post as manager of the firm's Roanoke, Va., office.

Westinghouse Electric Supply Co has appointed Russell N. Chapman New England district apparatus and supply sales manager. He formerly was manager of the company's branch at Providence, R. I.

Western Precipitation Corp has named Kenneth H. Cree manager of its new office at 1429 Peachtree Street, N. W., Atlanta, Ga. The area to be served by the Atlanta office includes Georgia, Tennessee, Mississippi, Alabama, Florida, and eastern Louisiana.

REPRESENTATIVES

Buchanan Electrical Products Corp, Hillside, N. J., has named Leo A. Roach, 4019 Clinton Ave, Richmond 22, Va., its representative in Virginia.

Metal Prices
Jan. 2, 1952

COPPER, Conn., V., lb	$ .24½
LEAD, N. Y., lb	.19
ZINC, prime Western, E. St. Louis, lb	.19½
TIN, Straits, qual. N. Y., lb	1.03
ALUMINUM, ingot, base price	.19
NICKEL, base price	.56½
STEEL, billets, Pitts., ton	56.00
STEEL, scrap, No. 1 heavy, Pitts., ton	45.00

Depa Adds Sels, Gohlke, and English to Its Staff

Defense Electric Power Administration recently added several men to its staff.

Hollis Kieffer Sels, transmission and distribution engineer for Public Service Electric & Gas Co, Newark, N. J., has joined the Power Supply Division.

Arthur Carl Gohlke, who has been in charge of the electrical engineering department of Cleveland Electric Illuminating Co, and George Harry English, who retires at the end of this year as superintendent of the system operating department of Kansas City Light & Power Co, are now serving as regional engineers in the Power Coordination and Planning Branch. Gohlke, whose assignment in Washington is for six months, will direct the activities of the Northeast region.

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DPA Structural Steel Staff to Scan Requests

Any electric utility as well as any other large user of structural steel which has been exaggerating its needs might as well stop. The Defense Production Administration has appointed six structural steel experts to its construction analysis staff. Their first duties will be to fine-comb structural requirements for the second quarter of 1952.

Major consumers of structural steel are getting their first attention—such programs as the armed services, electric power, petroleum, industrial expansion, and highways. Each analyst will tackle the project requirements of a single agency. Only those projects requiring 250 tons or more will be examined. It is these that account for most of the structural steel going into construction.

There have been no estimates as to the steel tonnage that can be saved. But a better quarter scheduling of structural deliveries is bound to result. Both steel mills and projects will benefit.

The staff is working in the construction division of DPA's Office of Program and Requirements. Staff director is James B. Steep, consulting engineer for Giffels & Vallet, Detroit architects. Other members are J. C. Hamilton, American Bridge Co; Gordon Galloway, Austin Co, engineers and builders; H. J. Mullin, United States Steel Corp; and H. J. Hess and R. E. Wilmot, Bethlehem Steel Co. All have long experience in taking off quantities and scheduling steel deliveries for construction.

Electrical Equipment Division—National Production Authority

(Prepared by Electrical World, Dec. 20, 1951)

Office of the Director
- Director—B. W. Clark (X3256)
- Deputy Director—L. D. Shank (X3257)
- Assistant to Director—H. E. Way (X5707)
- Administrative Officer—Frank Pontenzo (X3093)

Scheduling-Expediting Section—Chief, William S. Schmidt (X4117)

Outside Distribution Branch—Chief, D. A. Griffith (X3938)
- Pole Line Equipment Section—Chief, Herbert C. Landsell (X4260)
- Switchgear Section—Chief, R. N. McCollom (X4280)
- Transformer Section—Chief, G. W. Cooper (X3939)

Motor and Control Branch—Chief, S. H. Keller (X3947)
- Battery and Rectifier Section—Chief, E. D. Murray (X4452)
- Motor and Generator Section—Chief, Roger Kingsland (X3095)

Industrial and Domestic Electric Section—Chief, Jeb Darby (X4436)

Program and Distribution Branch—Chief, C. G. Laslie (X5410)
- CMP Acceptance Section—Chief, H. B. Findley (X3298)
- Statistical Section—Chief, C. W. Mueller (X5707)

Lighting and Interior Distribution Branch—Chief, William H. Kennedy (X5657)
- Exterior Lighting Equipment Section—Chief, Hugh Estes (X4138)
- Industrial and Commercial Lighting Equipment Section—Chief, J. H. Brundage (X4138)
- Residential Lighting Equipment Section—Chief, John Payne (X4129)
- Wiring Device Section—Chief, L. A. Sharp (X4117)

Interior Distribution Section—Acting Chief, E. S. Milligan (X5657)

Offices are on 2nd Floor of New General Accounting Office Building, 5th and H Sts., NW, Washington 25, D. C. Telephone extensions are on STerling 5200.

Canadian Oil Pipeline Gets Okay from Board

A 693-mile, 24-in. oil pipeline will be built from Edmonton, Alberta, to Vancouver, B. C., by Trans Mountain Oil Pipeline Co. The pipeline, slated for completion in 1953, will cost about $82 million.

Permit to built the pipeline was granted last month by the Federal Board of Transport Commissioners at Ottawa.

Work on right of way clearing is expected to start early this year and pipelaying about June 1, providing priorities for pipe are obtained. Actual pipelaying in western Alberta and most of British Columbia will be confined to six months during the summer and fall seasons because laying operations, particularly coating wrapping and welding, require dry weather and moderate temperatures.

At the start, the 24-in. line will have two pumping stations providing an initial capacity of 75,000 bbl per day. Ultimate capacity, with additional stations, will be 200,000 bbl per day.

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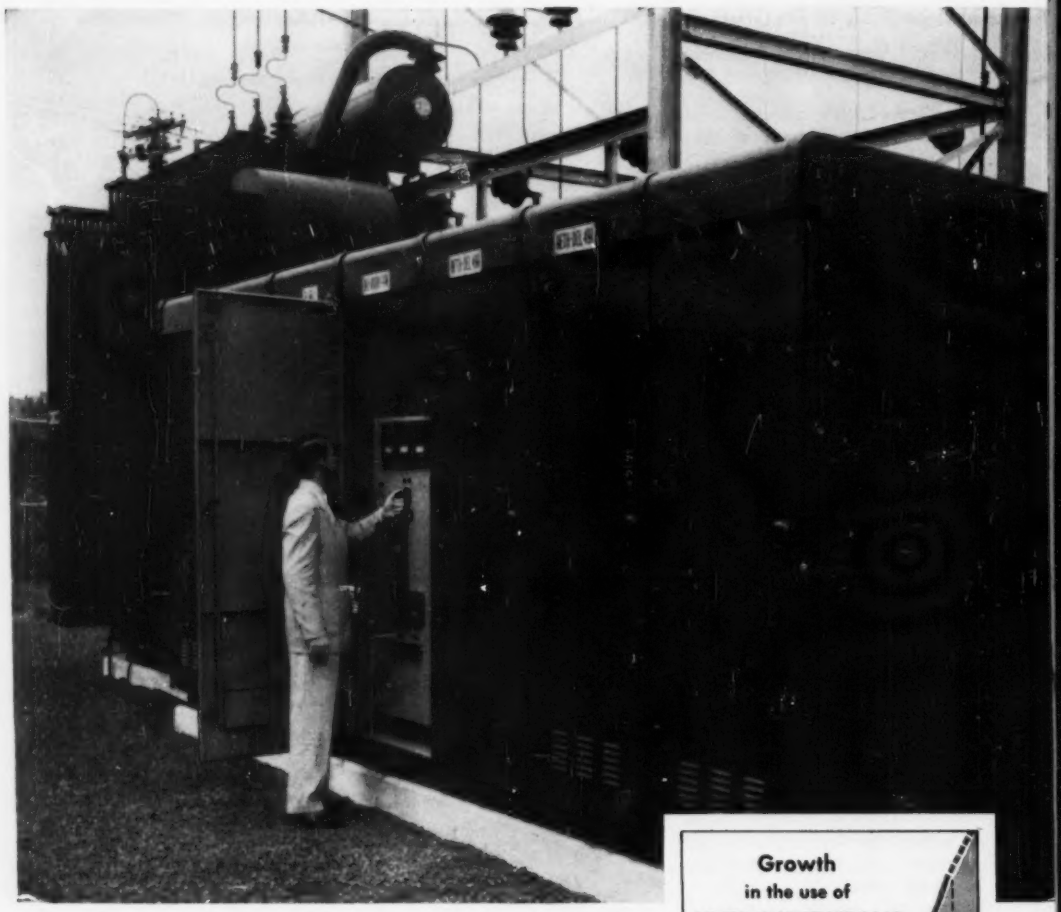
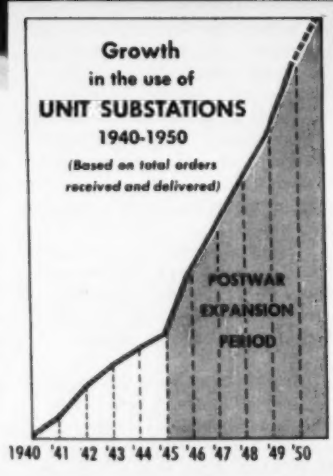
Tin Supply Limited

The National Production Authority has disclosed that the RFC stockpile of tin for industrial use is only 11,340 tons. This with some 1,600 tons a month from the government-owned Texas City, Texas, smelter is the only tin available to the United States during the first quarter of 1952.

Niagara Mohawk EXPANDS FAST at



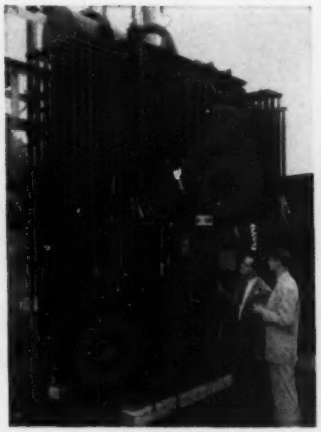
NIAGARA MOHAWK ADDS 10,000 quickly and easily with third and fourth G-E master unit substations (5000 kva each). The one above transforms 33 kv to 5.04 kv. Open compartment door shows operating panel for magne-blast breaker. More details in photos on opposite page.



WHAT DOES THIS TREND MEAN? Savings in time, money and materials are becoming more and more important. It also means that adaptable compact unit substations have proved to be perfectly suited in cases where "special designs" were thought necessary. You get plenty of flexibility when you use G-E packaged substations.

low cost—with G-E Unit Substations

CIRCUIT-BREAKERS are safely and easily removed for inspection. This view shows rear of Niagara Mohawk's new G-E metal-clad transformer main breaker in operating position. Breaker cannot be lowered for removal until it is tripped and power circuit interrupted.



YEARS OF MAINTENANCE-FREE SERVICE ahead for transformers in Niagara Mohawk's new unit substation. Bus regulation of voltage is provided by load-ratio-control equipment. Experience shows G-E LRC equipment requires very little maintenance.

FORESIGHT PAYS OFF again and again. Above is section of older G-E master unit substation installed by Niagara Mohawk in 1939. Growing loads posed no problem—new unit (barely visible, upper left) installed alongside, capacity increased by 5000 kva.

Quick, easy ordering and installation help Niagara Mohawk expand fast to meet increased demand in Albany area

Like many other utilities and industrial plants, Niagara Mohawk Power Corp. has shown it pays to use "packaged" power equipment. In this locality, they've chosen a standard distribution system (in this case: primary network) and a standard load increment, or "building block" of power (5000-kva). As load grows, a duplicate substation of this capacity is tied into the system, always a jump ahead of demand.

A G-E unit substation arrives ready for use—you simply spot in place, connect, and energize. You save not only on equipment and installation costs, but also valuable engineering time to use for over-all planning.

These are just a few reasons for the fast-growing trend to unit substations shown in the chart on the opposite page. Your local G-E representative can show you plenty of others. Call or write him. *General Electric Company, Schenectady 5, N. Y.*

EXTRA SAVINGS MADE BECAUSE OF FLEXIBILITY

IDEA TO SAVE MONEY: Photo above is close-up of G-E metal-clad auxiliary compartment, installed with rest of Unit Substation. Flexibility permitted Niagara Mohawk to install 48-volt battery, charger, telephone. By doing this instead of using special construction, Niagara Mohawk estimates they saved $5000 to $8000.

321-80

GENERAL ELECTRIC

FINANCIAL

YIELDS (%) — Operating Electric Utility Securities

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1951									
Dec. 27	3.02	3.07	3.21	4.32	4.50	4.91	5.42	6.18	6.84
Dec. 20	3.00	3.05	3.18	4.31	4.51	4.89	5.40	6.17	6.84
END OF QTR.									
4th 1951	3.02	3.07	3.21	4.32	4.50	4.91	5.42	6.18	6.84
3rd 1951	2.87	2.91	3.04	4.05	4.27	4.61	5.58	6.24	7.05
2nd 1951	3.02	3.11	3.23	4.11	3.37	4.68	5.73	6.38	7.78
1st 1950	2.87	2.93	3.00	3.96	4.19	4.52	5.47	6.20	7.13

Data: Reis & Chandler, Inc.

AP&L Makes Deal to Sell WWP

SEC, courts may be asked to rule on holding company's proposal to sell utility to 3 PUD's in Washington State

It is still a toss-up as to whether Securities and Exchange Commission or the courts will get the first crack at the latest proposal to sell Washington Water Power Co to public agencies.

Beneath the surface issue—the breaking of WWP from its parent company, American Power & Light—lies the burning private versus public power question. Also involved is the further busting up of the well-integrated WWP system in the power-hungry Pacific Northwest. Stockholders advocating private power and continuance of the integrated system have opposed the sale every step of the way. But Howard Aller, president of American, has been zealous in his efforts to sell out to public power.

Filed Notice Dec. 26 . . . He filed a notice of sale of the property with SEC Dec. 26. Early last week SEC had not decided whether it would attempt to exert jurisdiction over the proposed sale. In a similar situation early last year, it declined to take a stand by a 2-2 vote, but the makeup of the commission has since changed.

If the SEC stays out, the state and possibly the federal courts are almost certain to be asked to take a look at the complicated $65,115,000 deal by Aller and the mysterious financier, Guy C. Myers, who represents three Washington State PUD's. Threats of court action earlier have been voiced by representatives of the Governor of Idaho and also the City of Spokane.

As outlined in the notice to SEC, Aller proposes to sell all the WWP common stock to the three PUD's in Washington for about $65,115,000 in bonds and cash. After certain adjustments, it is estimated the net consideration will be "not less than $56 million and may amount to as much as $62 million." American's interest in WWP's common stock amounted to $66.6 million at present time, according to the sale notice.

Ask Certification . . . Since the sale is being made to public bodies, both American and the PUD's argue that SEC has no jurisdiction over the sale, but ask SEC to certify that the sale is being made as a means of carrying out the provisions of the Public Utility Holding Company Act. This is for the purpose of easing the tax burden on American.

Financing of the purchase would be through a bank loan or sale of bonds of the three districts, and the sale of the WWP stock to a "non-profit membership corporation."

Upon acquisition of WWP, the districts would then contribute to the capital of the company in an amount sufficient to discharge obligations amounting to $42,394,800. This would include retirement of first mortgage bonds, preferred stock, and bank loans as well as cover the excess of current liabilities over current assets and provide contingency cash.

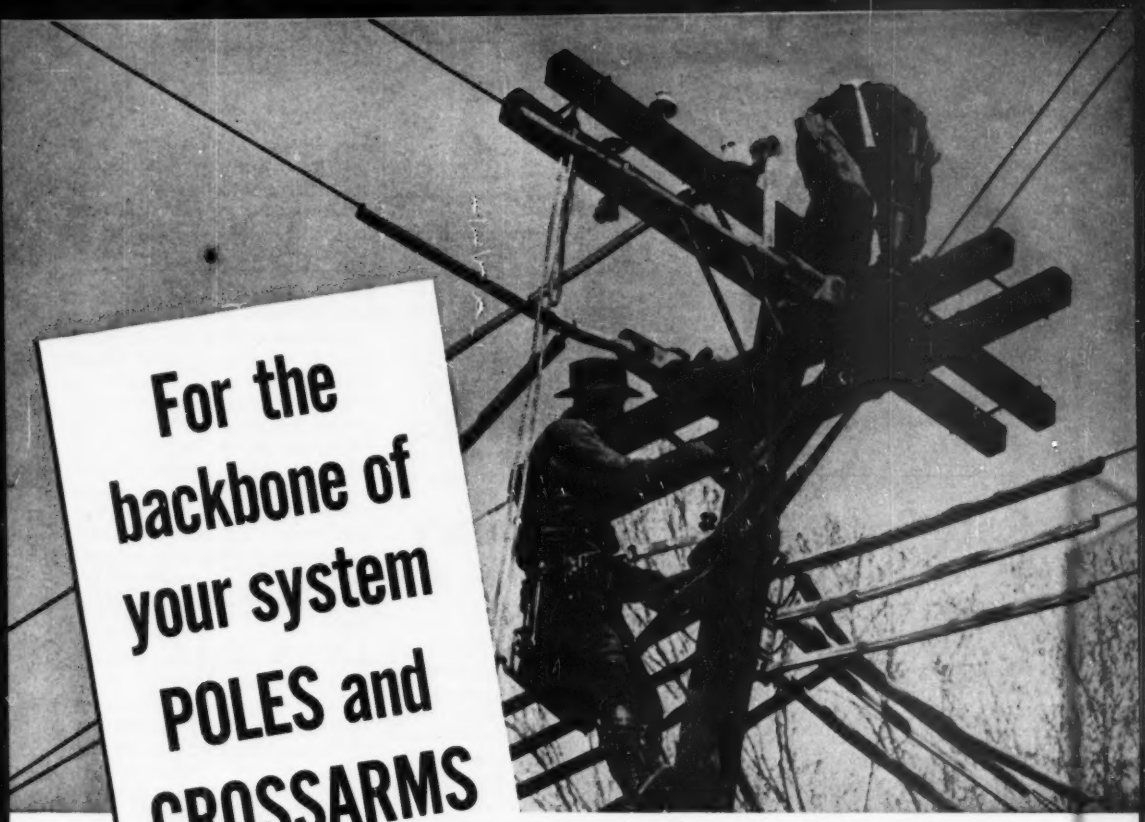
Myers' Commission . . . For his six-year part in engineering the deal, financier Myers would get 0.2% of the net proceeds of the bonds actually sold by the PUD's but not by the corporation for the completion of the transaction. In addition, he would get 0.8% payable out of profits over a ten-year period without interest.

Idaho Attorney General Robert E. Smylie at Boise labelled the AP&L move as a "delaying tactic", and wired the SEC asking that hearings be held. Smylie stated that the notice should be amended to conform to the requirements of a declaration, adding that the notice as filed "wholly fails to satisfy the SEC order of Oct. 20 that disposition of WWP stock be expeditiously completed."

Electric Utility Financing

Company and Description	Amount of Offering (000)	Offering Price	Yield at Price to Public
WEEK OF JANUARY 3-9			
Bonds			
Seattle, Wash.—municipal light and power rev. 1962-1986	$28,000	.....	.....
Sacramento, California—municipal utility district bonds	600	.....	.....
Philadelphi- Electric—1st and ref mtg 1982	35,000*	.....	.....
SCHEDULED FOR JANUARY			
Bonds			Bid Date
Indiana & Michigan Electric—1st mtg 1982	$17,000		Jan. 22
Indiana & Michigan Electric—serial notes 1956-1967	6,000		Jan. 22
Central Illinois Public Service—1st mtg 1982	5,000		.....
Preferred Stock			
Florida Power Corp—51,550 sh $100 par cum conv	5,155		.....
Kansas City Power & Light—100,000 sh $100 par	10,000		.....
Central Illinois Public Service—50,000 sh. $100 par	5,000		.....
Common Stock			
Pacific Power & Light—552,792 sh (200,000 sh to be sold by company and balance for selling stockholders)	.....		**Jan. 22
Kansas City Power & Light—317,792 sh	.....		.....

* To be offered by Drexel & Co and Morgan Stanley & Co group, underwriters.
** To be offered by Lehman Bros. group, underwriters.



For the backbone of your system POLES and CROSSARMS

Via GraybaR

The pole-line backbone that supports today's essential power lines needs seasoned strength and durability to do its job efficiently and at low maintenance cost.

That's one reason why power companies all over the nation choose Graybar for all their pole-line needs. They know that Graybar-distributed materials are always right for the job and stand up under abnormal stress of storms, ice, and snow.

POLES – Differing conditions lead to different local preferences. That's why Graybar distributes *all* types of poles – full-length, pressure-treated Southern Pine . . . full-length, pressure-treated Fir and Cedar . . . butt-treated Northern and Western Cedar.

All treated poles are carefully selected and processed to provide maximum strength and durability – plus the clean, smooth exterior surface required for city use.

CROSSARMS – Douglas fir crossarms via Graybar are selected and seasoned under rigid methods – are strong, long-lasting, and provide a wide margin of safety in the line.

POLE-LINE SUPPLIES – Graybar also distributes insulators, wire, cable, strand, hardware, tools, and hundreds of other needed pole-line supplies – all products of outstanding manufacturers.

To keep the backbone of your system strong, order your supplies from Graybar. You'll always get dependable items, and the nationwide Graybar warehouse system helps assure the *fastest possible* deliveries under today's uncertain conditions.

Because Graybar is wholly owned by its operating and retired personnel, you can always expect an extra measure of personal interest in serving you. Feel free to call your local Graybar Representative for information on any electrical item . . . call your nearby Graybar Outside Construction Specialist for planning aid and technical advice. *Graybar Electric Company, Inc. Executive Offices: Graybar Building, New York 17, N. Y.*

148-91

Everything for your pole lines
Via GraybaR

IN OVER 100 PRINCIPAL CITIES

Electric Utility Earnings

Company	Period Months	Ended	Net Income 1951	Net Income 1950	Balance Per Common Share 1951	Balance Per Common Share 1950
Alabama Power	12	Nov.	$10,702,700	$9,519,392	$....	$....
Arkansas P&L	12	Nov.	4,624,768	4,543,638	....	....
California Oregon Power	12	Nov.	2,378,634	2,008,849	1.87a	1.99a
Detroit Edison	12	Nov.	15,246,252	16,996,702	1.68	2.21
Georgia Power	12	Nov.	8,980,574	9,736,842	....	....
Kansas City P&L	12	Sept.	4,335,708	4,448,223	1.91b	1.97b
Louisiana P&L	12	Nov.	2,528,893	2,561,233	....	....
Mississippi Power	12	Nov.	1,855,729	1,567,646	....	....
Mississippi P&L	12	Nov.	2,985,460	2,723,218	....	....
Niagara Mohawk Power	12	Sept.	19,728,000	20,870,000	1.94	2.06
Ohio Edison	12	Nov.	12,766,885	14,206,165	2.58c	2.94c
Pennsylvania Power	12	Nov.	1,741,701	1,629,174	....	....
Southern Co.	12	Nov.	16,142,302	16,384,227	.99a	1.07a
Virginia E&P	12	Nov.	10,371,114	10,051,772	1.74e	1.94e
Washington Water Power	12	Sept.	3,060,268	3,061,322	....	....

a—On shares outstanding at end of each period; b—On 1,906,748 shares; c—On shares outstanding at end of 1951 period; e—On average number of shares during period.

Rate Boost Called 'Inflationary'

OPS protests hike asked by Pacific Gas & Electric Co at Public Utility Commission hearing

The Office of Price Stabilization has intervened in the California Public Utilities Commission hearing of Pacific Gas & Electric Co's application for an 18½% increase, protesting such a boost as "inflationary."

The federal agency, appearing as an "interested party," since utility rates are not controlled by OPS, said the $37,486,000 annual increase would bring cost increases to agriculture, industry, and government as well as residential consumers, "adding to inflationary pressure on all fronts."

Stanley K. Crook, OPS economist, declared that the utility would not be suffering a hardship if the application were denied—that the increases were "not absolutely necessary for the preservation of an essential industry."

PG&E is asking the increase to bring its 1952 rate of return to 5.8%, considered necessary if the expanding industry is to attract investment capital. Under present rates the return would be 4.21% in 1952 compared with 4.32% in 1951.

The agency introduced a letter from former Economic Stabilizer Eric Johnston, stating that price ceilings were "generally fair and equitable" if an industry's dollar profits amounted to 85% of the average for its best three years during the 1946-49 period.

Cross examination developed the fact that this criteria had been outdated by later Congressional action, but OPS witnesses reported that they had not received a directive on this matter.

The agency objected to PG&E's inclusion of federal taxes as part of its operating costs in figuring its rate of return, and suggested that the PUC give consideration to distinguishing between normal federal income taxes and special additional defense taxes as an allowable operating cost.

PG&E counsel moved that OPS exhibits and testimony be striken from the record since the agency had no jurisdiction in the case. The commission ruled, however, that although OPS findings were not binding, they might be relevant.

Among interested parties appearing at the hearing were representatives for nine northern California municipalities who threatened to attempt to break their contracts with PG&E and buy power from the Central Valley Project if the increase were granted. Included were Alameda, Palo Alto, Santa Clara, Biggs, Gridley, Lodi, Roseville, Ukiah, and Healdsburg.

A Sacramento Municipal Utility District representative filed a letter from the Bureau of Reclamation showing savings the SMUD could make by changing over from PG&E to the CVP.

The hearing was recessed to be resumed in January. The PG&E case was the second in California in which the OPS has intervened, the first being that of the California Electric Power Co, Riverside. The PUC in November granted that company $695,000 annually in rate increases, some $250,000 less than it had requested. The commission termed the lesser amount the minimum necessary to permit the company to continue the expansion program needed to serve its area.

FINANCIAL BRIEFS

Stockholders of both Central Arizona Light & Power Co and the Arizona Edison Co have voted almost 90% in favor of combining the two companies, moving their merger into the Arizona Public Service Co one step closer. Before the merger becomes effective, it must be approved by the Arizona Corporation Commission and the Federal Power Commission. The two companies hope that the necessary approvals may be granted so that the new company can begin operations on March 1.

REGULATIONS

Petersburg (Va.) City Council has authorized an additional 3% tax on electric, gas, telephone, and water bills. This increase will go into effect on Feb. 1 and will make a total of 8%.

Kansas Power & Light Co has received approval from the Kansas Corporation Commission for new rate schedule which will increase revenues by 2.94%.

WALL STREET

Utility stocks continue to move upwards this past week. New highs were registered by Central Hudson Gas & Electric Corp, Central & South West Corp, Consolidated Edison Co of New York, Indianapolis Power & Light Co, Middle South Utilities, and Southern Co. Stock brokers are advising their clients to buy more utility stocks. They feel that a Republican victory in 1952 would have a good effect on these stocks.

Wall Street boardrooms are buzzing with the earning prospects of Rochester Gas & Electric Corp. They say it will earn about $2.80 a share on the average outstanding common shares in 1951. It will jump to $3.20 to $3.40 a share in 1952. The stock is selling for about $33 a share and paying $2.24, which yields about 6.79%.

Revolutionary new [redacted] outdoor motor rings the bell!

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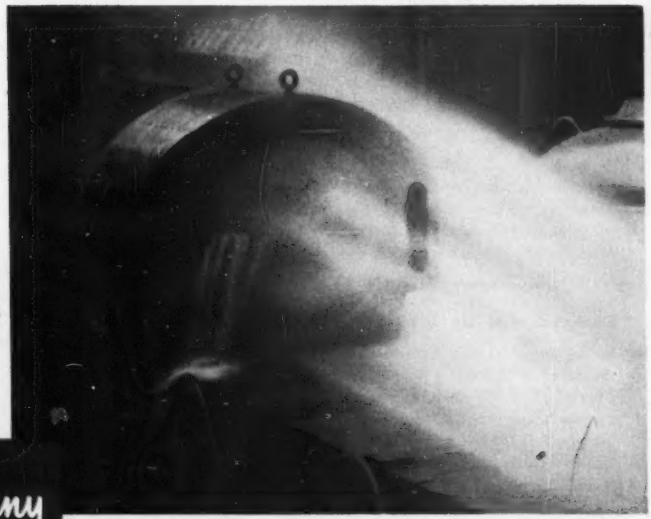
When we first announced our revolutionary new outdoor motor a year and a half ago, we *knew* it was good. Our customers thought so too! Since that time we have shipped or have on order over *155,000 hp* of these outstanding motors. They are now delivering dependable power for many types of drives in a wide variety of types of applications from border to border and from coast to coast . . . Day in and day out they operate unprotected in the heat, humidity, sand, alkalies, hurricanes of the South, salt spray of the coastal installations and blizzards of the far North . . . More and more industries are investigating the possibilities of this outstanding motor and the economies of outdoor installation. Available from first size above NEMA frames and larger. Call or write your nearest Elliott District Office for consultation.

Motor undergoing spray test at factory



L-826

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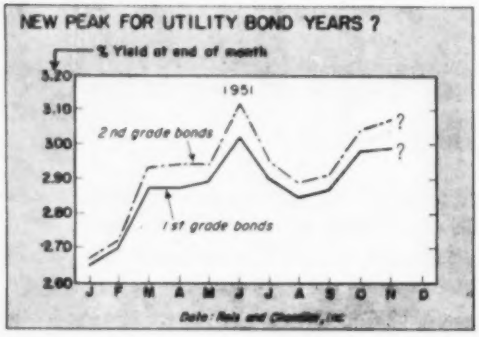
ELECTRICAL BUSINESS OUTLOOK



UPTREND in first and second grade bond yields is likely to continue next year, boosting money costs for utilities needing it for expansion

Money Market Tight

There's still a big volume of financing ahead for U. S. corporations—industrial as well as utilities. And it will keep the money market tight in the first part of 1952. New issues will have to pay high yields—near or above the 1951 peak (chart above). That's probably true of both bonds and preferred stocks.

It's clear there can't be much let-up in the rate of new corporate issues. Huge plant expansion programs are still ahead. And corporate earnings haven't been enough to finance expansion without going to the money market. Taxes and working capital needs have also reduced companies' cash. So the demand for new money is close to a postwar peak.

Money is usually tight in the first quarter of the year anyway because tax collections draw down individual and corporate savings. And this year will be especially bad because the seasonal tax squeeze is coming just at the time companies need money most to carry out defense expansion.

Demand Will Up Interest Rates

So for the next few months new security issues will tax the capacity of lending institutions and the general market. Interest rates are likely to continue the uptrend from last summer's low point. Utilities will be competing with heavy industrial flotations and with a continued high volume of tax-exempt municipal issues—including public housing bonds.

One of the key reasons why money will be tight is that insurance companies and other big lenders can't easily add to their available funds by selling government bonds. The Federal Reserve Board has made this risky by refusing to fix a price at which it will buy them. If many were sold, their price might drop sharply.

The board isn't likely to ease up much on its policy of credit restraint, at least while the defense program still poses some threat of inflation. The policy is cracking down hardest on credit for less essential purposes—housing, commercial construction, and postponable public works. But meanwhile interest rates rise for everyone.

The situation will improve as 1952 gets on. Much industrial financing will be completed in the first part of the year. And new mortgage financing—an important drain on institutional funds—will also decline steadily from now on. This ought to help the market for utility bonds. Insurance companies particularly will be in a better position to buy new issues. They've worked down their forward commitments considerably as shown on the chart below. Mainly, they're less committed to take up new residential mortgages. Right now the life insurance companies are putting their extra funds into new industrial securities.

Uncle Sam Too Will Need Money

Of course, there may be a new competitor for available funds in the second half of 1952. That's Uncle Sam. The Treasury will have to borrow several billions in the last months of '52.

The Treasury won't necessarily come into the long-term money market. Right now Washington is betting the likely deficit will be handled with short-term issues, if it's not too large. In terms of money costs, that's something to wish for, because a new long-term Treasury issue would probably call for another hike in interest rates.

In the past, Treasury issues got enough Federal Reserve support to ensure low-cost financing. And this helped the whole market. But the Federal Reserve isn't doing this any more. So the long-term outlook for money rates depends heavily on whether the government can keep its borrowing down.

LESS IN MORTGAGES, more in stocks and bonds, that's how insurance companies are planning their investment program. The increase in October represented defense financing

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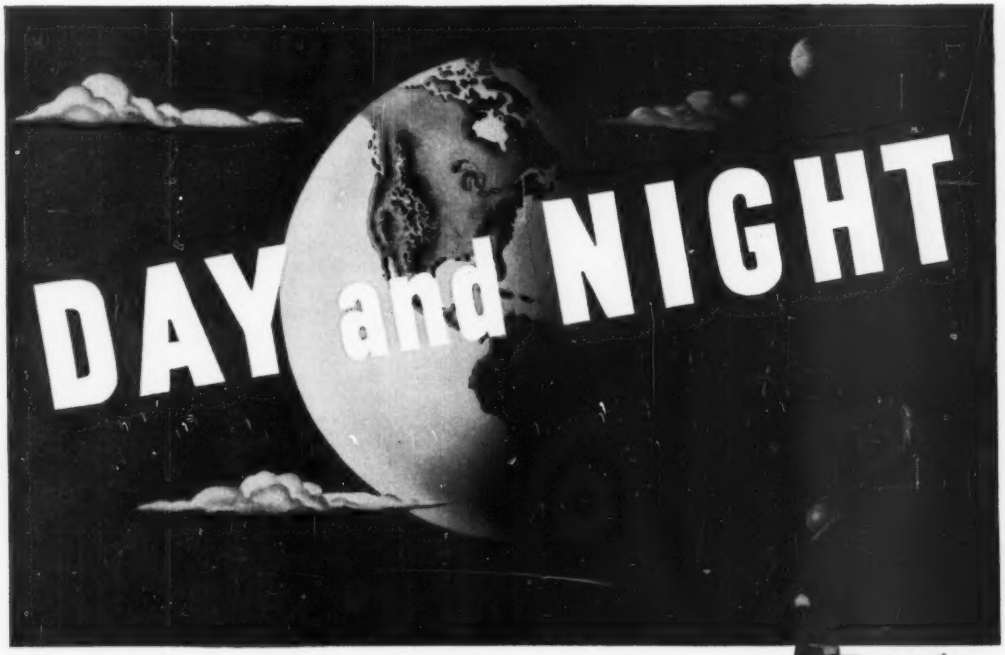

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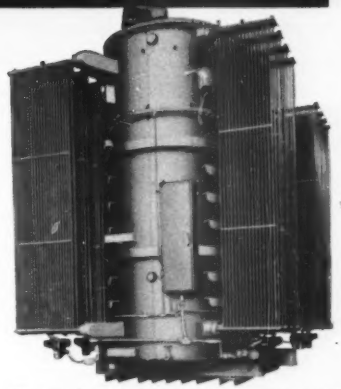
MBSD-1



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